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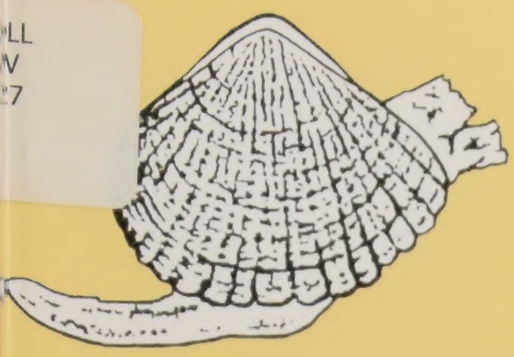

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SOCIETE ROYALE BELGE DE MALACOLOGIE

New species and new records of Chilodontidae (Gastropoda: Vetigastropoda: Seguenzioidea) from the Pacific Ocean

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KEYWORDS. Gastropoda, Chilodontidae, Indo-Pacific, *Vaceuchelus*, *Herpetopoma*, *Euchelus*, *Ascetostoma*, *Clypeostoma*, *Pholidotrope*, *Danilia*, *Perrinia*, new records, new species.

ABSTRACT. New records of Chilodontidae species described from various Pacific localities are listed, extending their distribution.
15 new species are described from New Caledonia, Fiji, French Polynesia, Solomon Islands and Taiwan, and compared with similar species: *Vaceuchelus cavernoides* n. sp., *V. phaios* n. sp., *V. rapaensis* n. sp., *Herpetopoma pantantoi* n. sp., *H. vitilevuense* n. sp., *H. hivaoaense* n. sp., *Euchelus polysarkon* n. sp., *Ascetostoma pteroton* n. sp., *Clypeostoma chranos* n. sp., *C. adelon* n. sp., *Pholidotrope asteroeides* n. sp., *P. choiseulensis* n. sp., *Danilia stroggylon* n. sp., *Perrinia cantharidoides* n. sp. and *P. guadalcanalensis* n. sp.
Two new synonymies are established: *Vaceuchelus saguili* Poppe, Tagaro & Dekker, 2006 from the Philippines is synonymized with *V. favosus* (Melvill & Standen, 1896), and *V. vangoethemi* Poppe, Tagaro & Dekker, 2006 from the Philippines is synonymized with *V. clathratus* (A.Adams, 1853)

RESUME. De nouveaux relevés de Chilodontidae décrits de diverses régions de l'Océan Pacifique sont listés, étendant leur aire de distribution.
15 nouvelles espèces sont décrites de Nouvelle-Calédonie, des Iles Fidji, de Polynésie française, des Iles Salomon et de Taïwan, et sont comparées avec des espèces similaires: *Vaceuchelus cavernoides* n. sp., *V. phaios* n. sp., *V. rapaensis* n. sp., *Herpetopoma pantantoi* n. sp., *H. vitilevuense* n. sp., *H. hivaoaense* n. sp., *Euchelus polysarkon* n. sp., *Ascetostoma pteroton* n. sp., *Clypeostoma chranos* n. sp., *C. adelon* n. sp., *Pholidotrope asteroeides* n. sp., *P. choiseulensis* n. sp., *Danilia stroggylon* n. sp., *Perrinia cantharidoides* n. sp. et *P. guadalcanalensis* n. sp.
Deux nouvelles synonymies sont établies : *Vaceuchelus saguili* Poppe, Tagaro & Dekker, 2006 des Philippines est placé en synonymie de *V. favosus* (Melvill & Standen, 1896), et *V. vangoethemi* Poppe, Tagaro & Dekker, 2006 des Philippines est placé en synonymie de *V. clathratus* (A.Adams, 1853).

INTRODUCTION

Chilodontidae species are probably one the less known Seguenzioidea and Trochoidea species. Apart from some remarkable taxa such as some *Euchelus* or *Herpetopoma* species, the others are often confused or simply ignored. Fortunately, since the 2000s, some authors undertook the clarification of the knowledge of some genera (Poppe et al., 2006; Herbert, 2012 & 2015), even also with comparison to fossil taxa from Jurassic and Cretaceous (Bandel, 2010).
Besides this fact, even the taxonomic position of this group of taxa has changed many times during these 30 late years. Without any aim of exhaustiveness, one can note the following steps:

- Vaught (1989) still considered that genera as *Euchelus*, *Herpetopoma* and *Calliotropis* as well belonged to the Margaritinae subfamily among Trochidae Rafinesque, 1815 species within the Trochacea Rafinesque, 1815 superfamily;
- Hickman & McLean (1990) brought a first major change while ranking these taxa into the Eucyclinae Koken, 1897 family, grouping *Euchelus*, *Herpetopoma* and related in a tribe Chilodontini Wenz, 1939, while ranking *Calliotropis* and related into a new tribe Calliotropini;
- Bouchet et al. (2005) produced a second disruption while moving the Chilodontini and Calliotropini taxa into the subfamilies Chilodontinae Wenz, 1938 and Calliotropinae Hickman & McLean, 1990, forming with Cataeginae McLean & Quinn, 1987 the family Chilodontidae Wenz, 1938 attached to the Seguenzioidea Verrill, 1884 superfamily;
- Finally, various accurate studies (Kano, 2008; Kano et al., 2009) leaded to identify 6 phylogenetic groups in Seguenzioidea among those were Seguenziidae, Chilodontidae, Calliotropidae and Cataegidae, giving to this three latter groups a full family status; this latter contribution is taken in account on WoRMS (World Register of Marine Species).

The present work describes several new species belonging to the Chilodontidae from various Indo-Pacific areas and confirms and/or extends the distribution area from known chilodontid species. This is also another attempt to enlighten the discriminant features to use in the study of these species.

Material and methods

The material studied in this paper was collected by French IRD-MNHN expeditions started up with the goal to study the biodiversity of invertebrates, especially molluscs, in a wide range of habitats of the Indo-Pacific (e.g. Crosnier et al., 1997; Bouchet et al., 2008). These campaigns have covered among others New Caledonia, Loyalty Islands, Fiji, French Polynesia, Tonga Islands, Vanuatu, Solomon Islands, Indonesia, Philippines and Taiwan. The following table lists the expeditions that have collected the studied samples:

Figure 1. Map of approximate locations of MNHN expeditions referenced in this paper :

◆ : TAIWAN 2000, TAIWAN 2001, TAIWAN 2002;
● : KARUBAR;
★ : SALOMON 1, SALOMON 2, SALOMONBOA 3;
◘ : MUSORSTOM 8, SANTO 2006, BOA 0, BOA 1;
⦿ : MUSORSTOM 10, BORDAU 1, SUVA 2, SUVA 4;
⊡ : MUSORSTOM 9, MARQUISES, POLYNESIE FRANCAISE;
O : BORDAU 2;
✚ : CORAIL 2;
⊗ : PALEO-SURPRISE, EBISCO, BATHUS 3;
☒ : CHALCAL 2, SMIB 3, SMIB 8, BERYX 11, BATHUS 3, NORFOLK 1, NORFOLK 2;
✱ : VAUBAN 1978-1979, LAGON, BIOCAL, MUSORSTOM 4, BIOGEOCAL, Campagnes d'essais 1987, BATHUS 1, BATHUS 2, MONTROUZIER, BATHUS 4;
✖: AURORA, MUSORSTOM 3, PANGLAO 2004, PANGLAO 2005;
✱ : MUSORSTOM 6, VOLSMAR, LIFOU 2000;
✦ : BENTHAUS, RAPA 2002;
✖: MUSORSTOM 7.

Campaign	Prospecting area	Date (m/y)
AURORA 2007	Philippines Sea	5-6/2007
BATHUS 1	Eastern New Caledonia	3/1993
BATHUS 2	Southern New Caledonia	5/1993
BATHUS 3	New Caledonia, Norfolk Ridge	11/1993
BATHUS 4	New Caledonia	8/1994
BERYX 11	Norfolk Ridge and Loyalty Ridge	10/1992
BENTHAUS	French Polynesia, Australes archipelago	11/2002
BIOCAL	Southern New Caledonia and Loyalty Islands	8-9/1985
BIOGEOCAL	Loyalty Basin	4-5/1987
BOA 0	Vanuatu	11/2004
BOA 1	Vanuatu	9/2005
BORDAU 1	Fiji Islands	2-3/1999
BORDAU 2	Tonga Islands	6/2000
Campagnes d'essais 1987	New Caledonia	1987
CHALCAL 2	Southern New Caledonia and Norfolk ridge	10-11/1986
CORAIL 2	Chesterfield Is., Lansdowne and Fairway banks	7-8/1988
EBISCO	Coral Sea	10/2005
KARUBAR	Indonesia, Kai and Tanimbar Islands	10-11/1991
LAGON	New Caledonia	5,8-12/1984
LIFOU 2000	Loyalty Islands	10-11/2000
MARQUISES	French Polynesia, Marquesas Islands	10/1997
MONTROUZIER	New Caledonia, Koumac and Touho sectors	10/1993
MUSORSTOM 3	Philippines	5-6/1980
MUSORSTOM 4	New Caledonia	9-10/1985
MUSORSTOM 6	Loyalty ridge	2/1989
MUSORSTOM 7	Wallis and Futuna Islands	5-6/1992
MUSORSTOM 8	Vanuatu	9-10/1994
MUSORSTOM 9	Marquesas Islands	8-9/1997
MUSORSTOM 10	Fiji Islands	8/1998
NORFOLK 1	New Caledonia, Norfolk Ridge	6/2001
NORFOLK 2	Norfolk Ridge	10-11/2003
PALEO-SURPRISE	Northern New Caledonia	4-5/1999
PANGLAO 2004	Central Philippines	5-6/2004
PANGLAO 2005	Bohol and Sulu seas, Philippines	5/2005
POLYNESIE FRANCAISE	French Polynesia, Marquesas Islands	10/1999
RAPA 2002	Austral Islands, Rapa Island	10-12/2002
SALOMON 1	Solomon Islands	9/2001
SALOMON 2	Solomon Islands	10-11/2004
SALOMONBOA 3	off Guadalcanal and Malaita	9-10/2007
SMIB 3	Southern New Caledonia and Norfolk Ridge	5/1987
SMIB 8	Norfolk Ridge	1-2/1993
SANTO 2006	Vanuatu	8-12/2006
SUVA 2	Fiji	10/1998
SUVA 4	Fiji	9-10/1999
TAIWAN 2000	South-western and eastern Taiwan	7-8/2000
TAIWAN 2001	North-eastern Taiwan	5/2001
TAIWAN 2002	North-eastern and southern Taiwan	5-9/2002
VAUBAN 1978-1979	New Caledonia	1978-1979
VOLSMAR	Matthew and Hunter	5-6/1989

Table 1. List of the Indo-Pacific MNHN expeditions mentioned.

Regarding the distribution of the new species and the extension of the distribution of known species, the range is taken from the internal intervals of the two extremes values.

As for the description methodology, the main conchological features used are (Figs 2 & 3):

- general shape of the shell: spire depressed or depressed - conical, cyrtoconoidal (=convex cone-shaped), coeloconoidal (=concave cone-shaped);
- size and shape of the protoconch;
- shape of the whorls: convex, concave, straight - with or without shoulder or keel;
- spiral cords of the whorls: ontogeny, number, beaded or smooth, distance between cords, especially features of the subsutural cord;
- axial sculpture of the whorls;
- shape of the aperture, denticles in the outer lip;
- shape of the base and spiral cords: number, beaded or smooth, distance between cords;
- features of the umbilicus: open or covered with a callus, relative size, presence/lack and shape of a parietal inducture;
- columella: excavated or not, with or without columellar tooth or teeth;
- colour: background colour, pattern with possible flames, spots or marks.

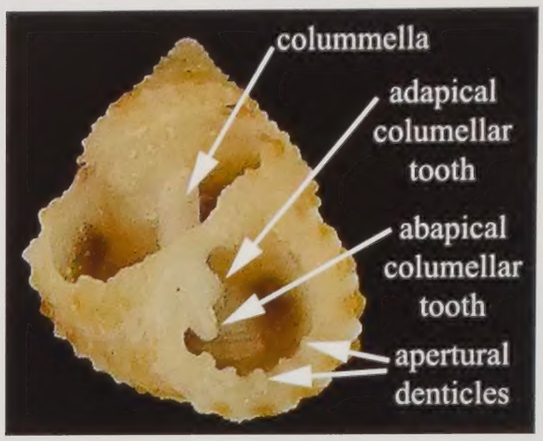

Figure 2. Useful features of chilodontid shells (1) (shell: *Clypeostoma adelon* n. sp., Loyalty Islands, LIFOU 2000, stn 1461, 100-120 m, 5.8 x 3.8 mm).

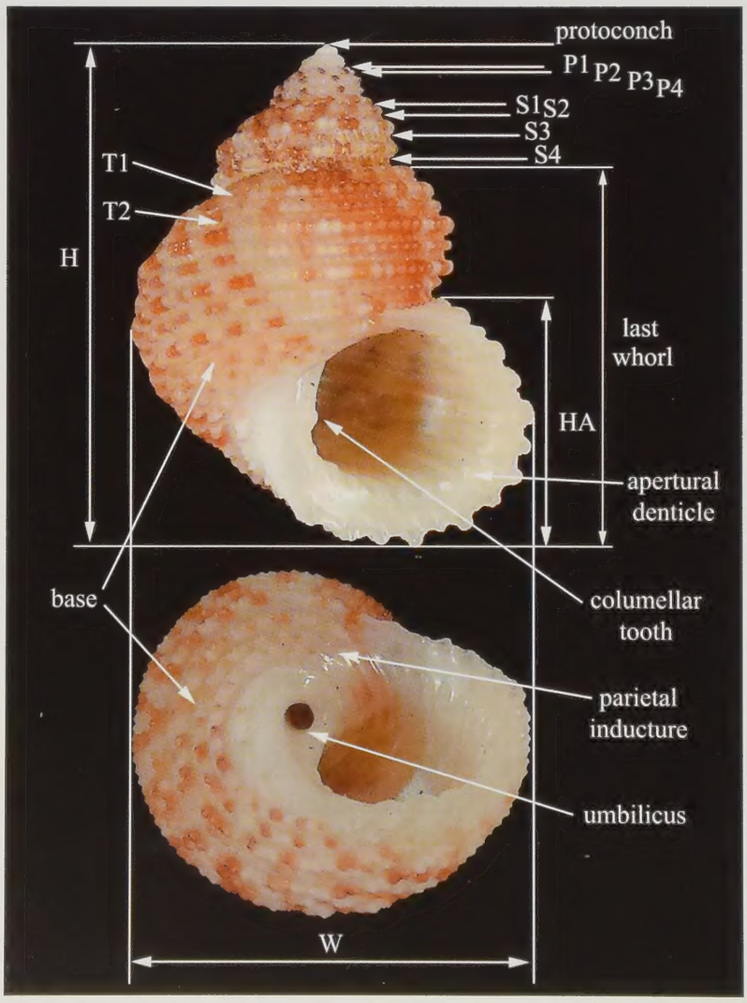

Figure 3. Useful features of chilodontid shells (2): H: height; W: width; HA: height of the aperture (shell: *Euchelus dampierensis* Jansen, 1994, Western Australia, Broome, intertidal area, 10.8 x 8.3 mm, coll C.Vilvens).

Abbreviations

Repositories

MNHN: Muséum national d'Histoire naturelle, Paris, France;
NHMUK: Natural History Museum of the United Kingdom, London, England;
USNM: National Museum of Natural History, Smithsonian Institution, Washington, USA.

Other abbreviations

H: height;
W: width;
HA: height of the aperture;
TW: number of teleoconch whorls;
P1, P2, P3, ...: primary cords (P1 is the most adapical);
S1, S2, S3, ...: secondary cords (S1 is the most adapical);
T1, T2, T3, ...: tertiary cords (numbered following appearance order);
stn: station;
lv: live-taken specimens present in sample;
dd: no live-taken specimens present in sample;
sub: subadult specimen;
juv: juvenile specimen;
est: estimated;
coll: collection;
CV: Claude Vilvens collection.

SYSTEMATICS

Superfamily **SEGUENZIOIDEA** Verrill, 1884
Family **CHILODONTIDAE** WENZ, 1938

Remarks. Herbert (2012) has given a very accurate characterization of the Chilodontidae from conchological and anatomical points of view, with in addition a useful key to genera of Chilodontidae in the south-western Indian Ocean.
Moreover, the study of the radula has finally led him to move the genus *Tibatrochus* from Chilodontidae to the Calliotropidae (Herbert, 2015). Earlier, Kano et al. (2009) have already established that *Turcica* H. & A. Adams, 1854, belongs to the Calliotropidae. So these two genera are excluded from the present study focusing only on Chilodontidae.
Mainly, the shells of the family can be characterized by

- a protoconch with a diameter usually between 200–300 µm, exsert and rather globose to, on the contrary, sunken and almost at the same level as the first teleoconch whorl;
- a rather elevated teleoconch (H/W>=1), without or with a rather narrow umbilicus;
- a first whorl with axial threads; spiral cords appearing on second or third whorls; last whorls with
- a more or less marked reticulate (sometimes even foveolate) pattern produced by crossing of axial and spiral sculpture;
- a columella without or with one or two teeth, very weak to very strong, the abapical one rounded, pointed or squared;
- possible denticles in the outer lip of the aperture.

The table 2 on the next page lists the taxa (known species and new species [in bold type]) examined in this study:

Vaceuchelus Iredale, 1929
Vaceuchelus scrobiculatus (Souverbie in Souverbie & Montrouzier, 1866) 7
Vaceuchelus foveolatus (A.Adams, 1853) 8
Vaceuchelus favosus (Melvill & Standen, 1896) 10
Vaceuchelus auricatris Huang & Fu, 2015 11
Vaceuchelus cavernoides n. sp. 11
Vaceuchelus phaios n. sp. 14
Vaceuchelus rapaensis n. sp. 16

Herpetopoma Pilsbry, 1889
Herpetopoma gemmatum (Gould, 1845) 19
Herpetopoma instrictum (Gould, 1849) 20
Herpetopoma xeniolum (Melvill, 1918) 22
Herpetopoma pantantoi n. sp. 22
Herpetopoma verruca (Gould, 1861) 24
Herpetopoma ludiviniae (Poppe, Tagaro & Dekker, 2006) 26
Herpetopoma poichilum Vilvens, 2012 26
Herpetopoma vitilevuense n. sp. 28
Herpetopoma naokoae Poppe, Tagaro & Dekker, 2006 30
Herpetopoma hivaoaense n. sp. 30
Herpetopoma corrugatum (Pease, 1861) 31
Herpetopoma rubrum (A.Adams, 1853) 32

Euchelus Philippi, 1847
Euchelus polysarkon n. sp. 34
Euchelus atratus (Gmelin, 1791) 35

Ascetostoma Herbert, 2012
Ascetostoma ringens (Schepman, 1908) 35
***Ascetostoma pteroton* n. sp.** 38

Hybochelus Pilsbry, 1890
Hybochelus cancellatus (Krauss, 1848) 39

Clypeostoma Herbert, 2012
Clypeostoma nortoni (McLean, 1984) 42
Clypeostoma chranos n. sp. 42
Clypeostoma cancellatum (Schepman, 1908) 43
Clypeostoma cecileae (Poppe, Tagaro & Dekker, 2006) 44
Clypeostoma adelon n. sp. 46

Pholidotrope Herbert, 2012
Pholidotrope asteroeides n. sp. 48
Pholidotrope choiseulensis n. sp. 49

Danilia Brusina, 1865
Danilia angulosa Vilvens & Héros, 2005 51
Danilia discordata Vilvens & Héros, 2005 51
Danilia eucheliformis (Nomura & Hatai, 1940) 52
Danilia stroggylon n. sp. 52

Chilodonta Etallon, 1862
Chilodonta suduirauti Poppe, Tagaro & Dekker, 2006 56

Perrinia H. & A.Adams, 1854
Perrinia angulifera (A.Adams, 1853) 60
Perrinia elisa (Gould, 1849) 61
Perrinia cantharidoides n. sp. 61
Perrinia guadalcanalensis n. sp. 62
Perrinia squamocarinata (Schepman, 1908) 64

Table 2. List of the Chilodontidae species studied in this paper.

Genus ***Vaceuchelus*** Iredale, 1929.
Type species: ***Euchelus angulatus*** Pease, 1867 [= *Monodonta foveolata* A. Adams, 1853] (by monotypy) – Recent, Pacific Ocean.

Remarks. The main features for *Vaceuchelus* are a small size (H < 10 mm), a whitish colour and a rough, cancellate or foveolate sculpture. Some species have labral denticles inside the outer lip of the aperture, others lack these denticles. Especially, Herbert (2012) pointed out as the main difference between *Herpetopoma* and *Vaceuchelus* genera the presence (*Herpetopoma*) or the lack (*Vaceuchelus*) of a peg-like tooth coupled with a U-shaped notch on the basal lip near the columella.

Vaceuchelus	shell shape	size (mm)	number of cords on penultimate whorl	which Si present ?	denticles in aperture ?	number of cords on base	open umbilicus ?	colour	frontal view
scrobiculatus	rounded conical	6.5x5.5	3	-	Y	3	N	yellowish white	
foveolatus	roundly conical to sl. cyrto-conoidal	6x6	3 (4th abapical cord covered by suture)	-	Y	3	Y (callus)	white to yellowish white	
favosus	cyrto-conoidal	3x2	3	-	N	3	Y	white	
auricatris	cyrto-conoidal	8.4x9	3(4)	S1,S2	Y	4	Y	nacreous white to bronze	
*cavernosus**	roundly conical	7.5x7.5	3	S1, S2, S3	N	4	Y	white with reddish brown spots	
cavernoides n. sp.	sl. cyrto-conoidal	5.6x6.3	4	S1+ S2,S3	N	3	Y	nacreous white	
phaios n. sp.	sl. cyrto-conoidal	5.4x5.2	5	S1+ S2,S3	Y	3-4	Y	nacreous brown to pinkish white	
rapaensis n. sp.	cyrto-conoidal	3.9x3.0	3	poss. S1	N	3	Y (partly covered by a callus)	yellowish nacreous white	
clathratus *	conical	9.3x7.8	2-3	-	N	3	N	cream white	

Table 3. Comparison of conchological features of some central Indo-Pacific *Vaceuchelus* species (sl. = slightly, poss. = possible, * = for comparison only, not studied in this paper).

Vaceuchelus scrobiculatus
(Souverbie in Souverbie & Montrouzier, 1866)
Figs 4A–J, Table 3

Trochus scrobiculatus Souverbie in Souverbie & Montrouzier, 1866: 140, pl. 6, fig. 9. Type locality: Art Island, New Caledonia.
Vaceuchelus scrobiculatus – Herbert, 1996: 424-426, figs. 32-33.
Vaceuchelus scrobiculatus – Poppe, Tagaro & Dekker, 2006: 47.

Material examined. New Caledonia. MONTROUZIER: stn 1261, 20°46'-20°47'S, 165°15'-165°17'E, 45-56 m, 2 dd. – Stn 1272, 20°41'S, 164°15'E, 82-120 m, 1 dd. – Stn 1273, 20°50'S, 165°23'E, 20 m, 1 dd, 1 dd juv. – Stn 1315, 20°41'S 164°15'E, 66-87 m, 4 lv, 3 sub dd. – Stn 1323, 20°41'S, 164°15'E, 82-120 m, 6 dd. – Stn 1331, 20°50'S, 165°20'E, 10 m, 1 dd. – Stn 1350, 22°18'S, 166°20'E, 3-6 m, 2 dd, 2 dd juv. – BATHUS 1: stn DW692, 20°35'S, 164°59'E, 140-150 m, 2 dd. – Stn DW1233, 22°24'S, 166°48'E, 45-50 m, 40 lv. –Menou coll., Baie St Vincent, ilot Tenia, 42 m, 1 dd sub, 1 dd juv.
Loyalty Islands. LIFOU 2000: stn 1445, 20°51'S, 167°10'E, 10-12 m, 1 dd.

Vanuatu. MUSORSTOM 8: stn DW1094, 15°08'S, 167°12'E, 312-314 m, 1 dd. – SANTO 2006: stn DB25, 15°38'S, 167°11'E, 10 m, 1 dd. – Stn DS59, 15°25'S, 167°14'E, 6-43 m, 2 dd, 1 dd juv. – Stn DB63, 15°27'S, 167°16'E, 21 m, 2 dd. – Stn DB69, 15°24'S, 167°13'E, 38 m, 1 dd, 1 dd juv. – Stn DB75, 15°23'S, 167°12'E, 20 m, 1 dd.
Fiji. MUSORSTOM 10: stn CP1366, 18°13'S 178°33'E, 149-168 m, 1 dd juv. –SUVA 4: stn DW08, 18°22'S, 178°02'E, 28-30 m, 1 dd.
Philippines. PANGLAO 2004: stn B12, 09°36'N, 123°43'E, 24-27 m, 2 dd. – Stn B24, 09°29'N, 123°56'E, 38 m, 1 dd, 2 dd sub, 1 dd juv. – Stn S25, 09°42'N, 123°51'E, 21 m, 1 dd. – Stn L49 , 9°37'N, 123°45'E, 90 m, 1 dd, 1 dd juv. – AURORA 2007: stn DW2750, 15°53'N, 121°54'E, 538 m, 2 dd.

Distribution. New Caledonia, 6-140 m, lv at 50-66 m; Loyalty Islands, 10-12 m (dd); Vanuatu, 10-312 m (dd); Fiji, 30-149 m (dd); Philippines, 21-538 m (dd).

Remarks. The main characteristics of this species are:
- height up to 6.5 mm, width up to 5.5 mm;
- rather elevated spire;
- teleoconch rounded conical, of about 4 convex whorls with 3 granular spiral cords on penultimate whorl; rounded periphery; more or less orthocline fine threads on first whorl, thickening on next whorls, very thick on last whorls; P3 at first whorl, P2 at second whorl, P1 at half third whorl; P2 and P3 the strongest; on last whorl, P4 peripheral, distance between P2 and P3 the largest, at least 2x width of cords;
- sculpture initially cancellate, becoming strongly foveolate with growth;
- aperture subcircular to weakly elliptical, with denticles in outer lip;
- base convex, with 3 thick spiral cords; distance between cords about 1.5x width of cords;
- no umbilicus;
- yellowish white.

Vaceuchelus foveolatus (A.Adams, 1853)
Figs 4K–S, Table 3

Monodonta foveolata A.Adams, 1853: 176. Type locality: Lord Hood's Island (nowadays Marutea Atoll), Tuamotu group, French Polynesia, 15-18 m.
Euchelus angulatus Pease, 1867: 283, pl.23a, fig. 27. Syn.
Euchelus (Herpetopoma) foveolatus – Marshall, 1979: 524-525, figs. 2A-E.
Euchelus foveolatus – Kaicher, 1990: card # 5790.
Euchelus angulatus – Herbert, 1996: 426, figs. 74-75. Syn.
Vaceuchelus foveolatus – Poppe, Tagaro & Dekker, 2006: 48, pl.16, fig. 2.
Vaceuchelus foveolatus – Vilvens, 2012: 8, figs 24-25.
Vaceuchelus foveolatus – Herbert, 2012: 447, 451.

Material examined. Philippines. PANGLAO 2004: stn B41, 09°31'N, 123°41'E, 17-19 m, 1dd, 1dd juv. – PANGLAO 2005: stn DW2374, 08°44'N, 123°14'E, 105-109 m, 1 dd.
Solomon Islands. SALOMON 1: stn DW1742, 11°29'S, 159°57'E, 366-421 m, 1 dd. – SALOMON 2: stn DW2234, 6°51'S, 156°24'E, 192-277 m, 1 dd.
French Polynesia, Australes Archipelago. BENTHAUS: stn DW2001, 22°27'S, 151°20'W, 200-250 m, 1 dd.

Distribution. Solomon Islands, 277-366 m (dd); French Polynesia, Australes Archipelago, 200-250 m (dd); Philippines (using also data of Poppe et al., 2006), 4-105 m (dd).

Remarks. The main characteristics of this species are:
- height up to 6 mm, width up to 6 mm;
- moderately elevated spire;
- teleoconch roundly conical to weakly cyrtoconoidal, of about 4 convex whorls with 4 strong, similar in size, moderately thick, granular spiral cords on last whorl; P3 appearing near end of first whorl, quickly strong on second whorl and making keel; P2 appearing on second whorl, quickly almost as strong as P3; P1 resolving and P4 emerging from suture on third whorl; last whorl very convex, the three abapical cords making keel, distance between them 2x width of cords;
- prosocline, rather thick axial threads; sculpture cancellate, more or less foveolate on last whorls;
- aperture subcircular, with denticles all around the outer lip;
- base convex with 3 spiral cords, the innermost a bit weaker and bordering the umbilicus; distance between cords 1x to 1.5x width of cords;
- narrow umbilicus, deep, possibly partly covered by a callus on mature shells;
- white to yellowish white.

Figure 4 (scale bar: 1 mm).

A-J. ***Vaceuchelus scrobiculatus*** (Souverbie in Souverbie & Montrouzier, 1866). **A-C.** New Caledonia, MONTROUZIER, stn 1272, 10 m, 5.5 x 4.2 mm. **D-F.** Philippines, PANGLAO 2004, stn B24, 38 m, 5.6 x 5.3 mm. **G-J.** New Caledonia, BATHUS 1, stn DW1233, 45-50 m. **G-H.** 3.9 x 3.3 mm. **I-J.** 4.9 x 4.4 mm.
K-S. ***Vaceuchelus foveolatus*** (A.Adams, 1853). **K-M.** French Polynesia, Australes Archipelago, BENTHAUS, stn DW2001, 200-250 m, 4.2 x 4.3 mm. **N-P.** Solomon Islands, SALOMON 2, stn DW2234, 192-277 m, 2.9 x 3.0 mm. **Q-S.** Philippines, PANGLAO 2005, stn DW2374, 105-109 m, 7.0 x 3.5 mm.

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Marshall (1979) gave an accurate description of the conchological main features. We follow here Herbert (1996, 2012) who considers that *Vaceuchelus angulatus* (Pease, 1867) is a likely synonym of *V. foveolatus*.

Vaceuchelus favosus (Melvill & Standen, 1896)
Figs 5A–J, Table 3

Euchelus favosus Melvill & Standen, 1896: 311, pl.XI, fig. 74. Type locality: Lifou, Loyalty Islands.
Vaceuchelus favosus – Herbert, 2012: 447, figs. 70E-G.
Vaceuchelus saguili Poppe, Tagaro & Dekker, 2006: 50-51, pl.18, fig.3. **Syn. n.**

Material examined. New Caledonia. MONTROUZIER: stn 1250, 20°47'S, 165°14'E, 3-6 m, 1 dd. – Stn 1255, 20°43'S, 165°08'E, 11 m, 1 dd. – Stn 1257, 20°44'S, 165°11'E, 25-26 m, 2 dd. – Stn 1259, 20°45'S, 165°14'E, 15-35 m, 11 dd, 1 dd juv. – Stn 1268, 20°45'S, 165°08'E, 9-11m, 2 dd. – Stn 1269, 20°35'S, 165°08'E, 15-20 m, 25 dd. – Stn 1270, 20°45'S, 165°17'E, 10-35 m, 3 dd, 4 dd juv. – Stn 1271, 20°45'S, 165°08'E, 5-25 m, 10 dd. – Stn 1272, 20°50S, 165°20'E, 10 m, 16 dd, 1 dd juv. – Stn 1273, 20°50'S, 165°23'E, 20 m, 20 dd. – Stn 1291, 20°22'S, 164°07'E, intertidal, 1 dd. – Stn 1306, 20°39'S, 164°12'E, 11-13 m, 1 dd. – Stn 1316, 20°40'S 164°11'E, 12 m, 4 dd. – Stn 1322, 20°41'S, 164°15'E, 53-71 m, 2 dd sub. – Stn 1323, 20°41'S, 164°15'E, 82-120 m, 1 dd. – Stn 1331, 20°40'S, 164°11'E, 55-57 m, 8 dd, 1 dd juv. – Stn 1351, 22°20'S, 166°26'E, intertidal, 1 dd, 2 dd sub, 2 dd juv. – Stn1351, 22°20'S, 166°26'E, intertidal, 1 dd sub. – Stn 1352, 22°22'S, 166°16'E, 27-35 m, 12 dd, 2 dd sub, 9 lv juv. – Stn 1354, 22°22'S, 166°16'E, 27-37 m, 5 dd. – Stn 1284, 20°34'S, 164°11'E, intertidal, 5 lv, 1 dd juv. – NORFOLK 1: stn DW1727, 23°17'S, 168°14'E, 190-212 m, 3 dd.
Loyalty Islands. LIFOU 2000: stn 1410, 20°57'S, 167°03'E, 4 m, 2 dd. – Stn 1413, 20°55'S, 167°05'E, 3-10 m, 2 dd. – Stn 1418, 20°47'S, 167°08'E, 1-5 m,1 dd. – Stn 1422, 20°47'S, 167°07'E, 4 m, 4 dd, 1 dd juv. – Stn 1425, 20°47'S, 167°07'E, 4-5 m, 3 dd, 1 dd juv. – Stn 1429, 20°48'S, 167°07'E, 8-18 m, 5 dd. – Stn 1430, 20°48'S, 167°07'E, 20-25 m, 1 dd, 1 dd juv. – Stn 1432, 20°54'S, 167°03'E, 12-32 m, 32 dd. – Stn 1434, 20°53'S, 167°08'E, 5-20 m, 15 dd. – Stn 1435, 20°55'S, 167°01'E, 5-30 m, 22 dd. – Stn 1436, 20°56'S, 167°04'E, 10-20 m, 2 dd. – Stn 1441, 20°46'S, 167°02'E, 20 m, 2 dd, 1 dd juv. – Stn 1442, 20°46'S, 167°02'E, 47 m, 2 dd. – Stn 1444, 20°55'S, 167°05'E, 9-20 m, 1 dd. – Stn 1448, 20°46'S, 167°02'E, 20 m, 7 dd, 3 dd sub. – Stn 1449, 20°46'S, 167°02'E, 17 m, 1 dd. – Stn 1450, 20°46'S, 167°02'E, 27-31 m, 5 dd. – Stn 1451, 20°47'S, 167°07'E, 10-21 m, 2 dd, 1 dd juv. – Stn 1453, 20°55'S, 167°02'E, 21-30 m, 2 dd, 2 dd sub. – Stn 1454, 20°57'S, 167°02'E, 15-18 m, 9 dd. – Stn 1457, 20°47'S, 167°03'E, 5-10 m, 9 dd.
Fiji. MUSORSTOM 10: stn DW1381, 18°18'S, 177°54'E, 275-430 m, 10 dd, 9 dd juv. – BORDAU 1: stn DW1451, 16°45'S, 180°00' E, 400-460 m, 4 dd. – Stn DW1469, 19°40'S, 178°10'W, 314-377 m, 2 dd. – Stn DW1494, 18°55'S, 178°29'W, 240-319 m, 1 dd. – SUVA 2: stn BS18, 18°11'S, 178°28'E, 83 m, 1 dd.
Solomon Islands. SALOMON 1: stn DW1767, 8°19'S, 160°40'E, 98-200 m, 9 dd, 9 dd sub.
Philippines. PANGLAO 2004: stn B42, 09°37'N, 123°46'E, 30-33 m, 1 lv.
Vanuatu. SANTO 2006: DB25, 15°38'S, 167°11'E, 10 m, 1 dd.
Wallis Island. MUSORSTOM 7: stn DW 601, 13°19'S 176°17'W, 350 m, 6 dd.
Marquesas Archipelago. MUSORSTOM 9: stn DR1247, 10°34'S, 138°42'W, 1150-1250 m, 1 dd. – Stn DR1298, 8°49'S, 140°17'W, 305 m, 2 dd.

Distribution. New Caledonia, 0-190 m, lv at intertidal level; Loyalty Islands, 4-47 m (dd); Fiji, 83-400 m (dd); Solomon Islands, 98-200 m (dd); Philippines, 30-33 m (lv); Vanuatu, 10 m (dd); Wallis Island, 350 m (dd); Marquesas Archipelago, 305-1150 mm (dd).

Remarks. The main characteristics of this species are:
- height up to 3 mm, width up to 2 mm;
- protoconch sunken, lower than the first whorl;
- teleoconch of about 4 convex whorls, cyrtoconoidal in shape, with 3 granular spiral cords on penultimate whorl; moderately elevated spire; rounded periphery; strong axial folds on first whorl, distance between folds 2x width of them; P3 at first whorl, P2 at second whorl, P1 at half third whorl; P2 and P3 the strongest; distance between cords 2x width of cords; P4 peripheral; the three abapical cords producing keel on last whorl; beads of cords possibly rather sharp; axial threads thickening to become very thick on last whorls;
- sculpture initially cancellate, becoming strongly foveolate on last whorls;
- base convex, with 3 thick spiral cords, the two outermost strong and thick, the innermost one very weaker, bordering umbilicus; distance between cords about 1.5x to 2x width of cords;
- aperture subcircular, without denticles inside the outer lip;
- rather wide, deep, funnel shaped umbilicus;
- white.

Herbert (2012) pointed out that this species from the Loyalty Islands is poorly known. He designated a lectotype in the Manchester Museum type material. Because of the ignorance of this species, there has been probably many confusions with *V. foveolatus* (A.Adams, 1853), that is much larger regarding the same number of whorls, has apertural denticles and an umbilicus partly covered by callus on adult shells.

V. saguili Poppe, Tagaro & Dekker, 2006 described from the Philippines based on a single dead specimen, is only compared in its original description to another new Philippine species (*V. abdii*, Poppe, Tagaro & Dekker, 2006), ignoring *V. favosus*. Clearly the description and the figure match very well with the lectotype figured by Herbert (2012) and it can be concluded that *V. saguili* is a synonym of *V. favosus*.

Vaceuchelus auricatris Huang & Fu, 2015
Figs 6H–I, Table 3

Vaceuchelus auricatris Huang & Fu, 2015: 66, pl. 1, figs 1-3. Type locality: South China Sea, Taiwan Strait, 220-350 m.

Material examined. Solomon Islands. SALOMONBOA 3: stn DW2775, 9°23'S, 160°57'E, 282-427 m, 1 dd.

Distribution. South China Sea, Taiwan Strait, 220-350 m (original description); Solomon Islands, 282-427 m (dd).

Remarks. The main characteristics of this species are:
- height up to 8.4 mm, width up to 9 mm;
- moderately elevated spire;
- teleoconch cyrtoconoidal, of about 4 convex whorls with 3 granular spiral cords on penultimate whorl; rounded periphery;
- 3 spiral cords P1, P2 and P3, sometimes with already additional S1, on the penultimate whorl; S2 possible; P4 visible on the last whorl; axial threads between cords, making a cancellate sculpture;
- aperture subcircular to weakly elliptical, with about 14 couple of denticles on outer lip;
- base convex, with 4 thick spiral cords; distance between cords about 1.5x width of cords;
- rather wide umbilicus, partly covered by a small parietal callus;
- teleoconch first whorls nacreous ivory, last whorls bronze on Taiwanese samples.

This single specimen from Solomon Islands, coupled with a single record in the Philippines (G.Poppe, personal communication) extends greatly the distribution of this recently described species.

Vaceuchelus cavernoides n. sp.
Figs 5K–S, Tables 3,4

Type material. Holotype (4.1 x 4.8 mm) MNHN (IM-2000-32778). Paratypes: 4 MNHN (IM-2000-32779, MNHN IM-2000-32780 as listed below).

Type locality. New Caledonia, Grand Récif de Koumac, MONTROUZIER, stn 1318, 20°41'S, 164°15'E, 20-30 m.

Material examined. New Caledonia. BATHUS 2: stn DW717, 22°44'S, 167°17'E, 350-393 m, 1 dd sub, 1 dd juv. – MONTROUZIER: stn 1260, 20°44'S, 165°14'E, 49–59 m, 30 dd. – Stn 1269, 20°35'S, 165°08'E, 15–20 m, 1dd, 1 dd juv. – Stn 1270, 20°45'S, 165°16.5'E, 10-35 m, 4 dd. – Stn 1271, 20°45'S, 165°08.0'E, 5–25 m, 20 dd juv. – Stn 1272, 20°50'S, 165°20'E, 10 m, 1 dd. – Stn 1273, 20°50'S, 165°23'E, 20 m, 3 dd juv. – Stn 1292, 20°22'S, 164°07'E, 0-1 m, 1 dd sub, 3 dd juv. – Stn 1310, 20°40'S, 164°15'E, 15 m, 3 dd juv. – Stn 1312, 20°40'S, 164°15'E, 26-40 m, 1 dd, 6 dd juv. – Stn 1318, 20°41'S, 164°15'E, 20-30 m, 4 lv, 10 lv sub, 10 lv juv (holotype and paratypes MNHN 1 and 2 IM-2000-32779). – Stn 1319, 20°45'S, 164°16'E, intertidal, 3 lv, 1 lv juv (paratypes MNHN 3 and 4 IM-2000-32780). – Stn 1339, 22°22'S, 166°15'E, 20 m, 1 lv. – Stn 1340, 22°21'S, 166°14'E, 30 m, 1 dd. – Stn 1352, 22°22'S, 166°16'E, 27-35, 1 dd. – Stn 1354, 22°22'S, 166°16'E, 27-37 m, 1dd sub, 2 dd juv. – Stn 1356, 22°20'S, 166°15'E, 20-23 m, 1 dd juv. – Stn 1358, 22°19'S, 166°28'E, 14 m, 1 dd. – Stn 1373, 22°20'S, 166°13'E, 9-10 m, 1 dd.
Loyalty Islands. LIFOU 2000: stn 1419, 5 m, 20°56'S, 167°05'E, 5 m, 1 dd sub. – Stn 1434, 20°53'S, 167°08'E, 5-20 m, 1 dd. – Stn 1435, 20°55'S, 167°00'E, 5-30 m, 1 dd. – Stn 1454, 20°57'S, 167°02'E, 15-18 m, 1 lv sub. – Stn 1455, 20°57'S, 167°03'E, 15-20 m, 1 lv sub.
Vanuatu. SANTO 2006: stn DS04, 15°31'S, 167°14'E, 25 m, 1 dd, 1 dd juv. – Stn DB08, 15°34'S, 167°13'E, 2 m, 2 dd, 1 dd juv. – Stn ZB09, 15°41'S, 167°05'E, 5-7 m, 6 lv, 1 dd juv. – Stn NB12, 15°33'S, 167°10'E, 20 m, 1 dd. – Stn LD20, 15°42'S, 167°15'E, 2-5 m, 2 dd sub. – Stn ZS22, 15°33'S, 167°10'E, 27-29 m, 3 dd. – Stn NB43, 15°36'S, 167°16'E, 6-30 m, 1 dd, 2 dd juv. – Stn DB46, 15°29'S, 167°15'E, 2-3 m, 1 dd. – Stn AT52, 15°32'S, 167°13'E, 52-62 m, 1 lv. – Stn DB65, 15°26'S, 167°13'E, 13 m, 1 lv. – Stn DB69, 15°24'S, 167°13'E, 38 m, 2 dd.
Solomon Islands. SALOMON 1: stn DW1776, 8°20'S, 160°41'E, 295-381 m, 1 dd.
Philippines. PANGLAO 2004: stn B7, 09°36'N, 123°52'E, 4-30 m, 2 dd, 1 dd juv.

Distribution. New Caledonia, 1-350 m, lv at 1-20 m; Loyalty Islands, 5-15 m, lv at 15-18 m; Vanuatu, 2-52 m, lv at 7-52 m; Solomon Islands, 295-381 m (dd); Philippines, 4-30 m (dd).

Diagnosis. A small, wider than high, whitish *Vaceuchelus* species with a rather depressed, cyrtoconoidal spire, a weakly subangular periphery, 4 strong, granular spiral cords on the penultimate whorl and additional thinner cords on last whorl, the three abapical cords making keel with strong axial ribs between them giving a foveolate pattern, a moderately convex base with usually 3 strong spiral cords and an inner cord sinking into the narrow umbilicus.

Description. *Shell* of rather small size for the genus (height up to 5.6 mm, width up to 6.3 mm), wider than high, rather depressed, rather thick, slightly cyrtoconoidal; height 0.8x to 0.9x width, height 1.8x to 2.2x aperture height; narrowly umbilicate.
Protoconch about 100 µm, of 1 whorl, at the same level as first teleoconch whorl, with a thin terminal varix.
Teleoconch up to 4.7 convex whorls, bearing 4 thick, similar in size, granular, spiral cords on the penultimate whorl, with additional intercalated thinner cords on last whorl; strong axial prosocline ribs between cords; periphery weakly subangular. Suture visible, not canaliculated.
First whorl convex, sculptured by about 20 prosocline, smooth, rather thick threads, interspace similar in size to threads; P3 appearing at mid whorl, thickening quickly. On second whorl, P3 strong, making a median keel; P2 appearing at begin of whorl; P4 emerging from suture at mid whorl, suprasutural; axial threads a little stronger, distance between them greater than width of threads. P1 appearing at begin of the third whorl; all the 4 cords similar in size at end of whorl; axial threads becoming strong ribs, distance between about 2x width of cords; S1 appearing at end of the whorl or at begin of fourth whorl, quickly as thick as the other cords; interspace between ribs strongly excavated, producing a foveolate pattern on the whole whorl. S2 and S3 appearing at end of last whorl, remaining thinner than the other cords. On last whorl, P2, P3 and P4 making moderate keel.
Columella curved, slightly oblique.
Aperture oval, slightly elongated and slightly oblique; outer lip without denticles inside, crenulated by inner folds corresponding to external spiral cords; inner lip flaring in its basal part.
Base moderately convex, with 3 (exceptionally 4 on very large specimen - see paratype 1) granular, prominent spiral cords similar to the Pi of the last whorl and an additional inner spiral cord nearly smooth, sinking into the umbilicus.
Umbilicus rather narrow (about 1/10 base width), funnel shaped.
Colour of teleoconch nacreous white; primary spiral cords with one per two to one per four brown beads; protoconch whitish.
Operculum corneous, multispiral with central nucleus, light brown, somewhat translucent.

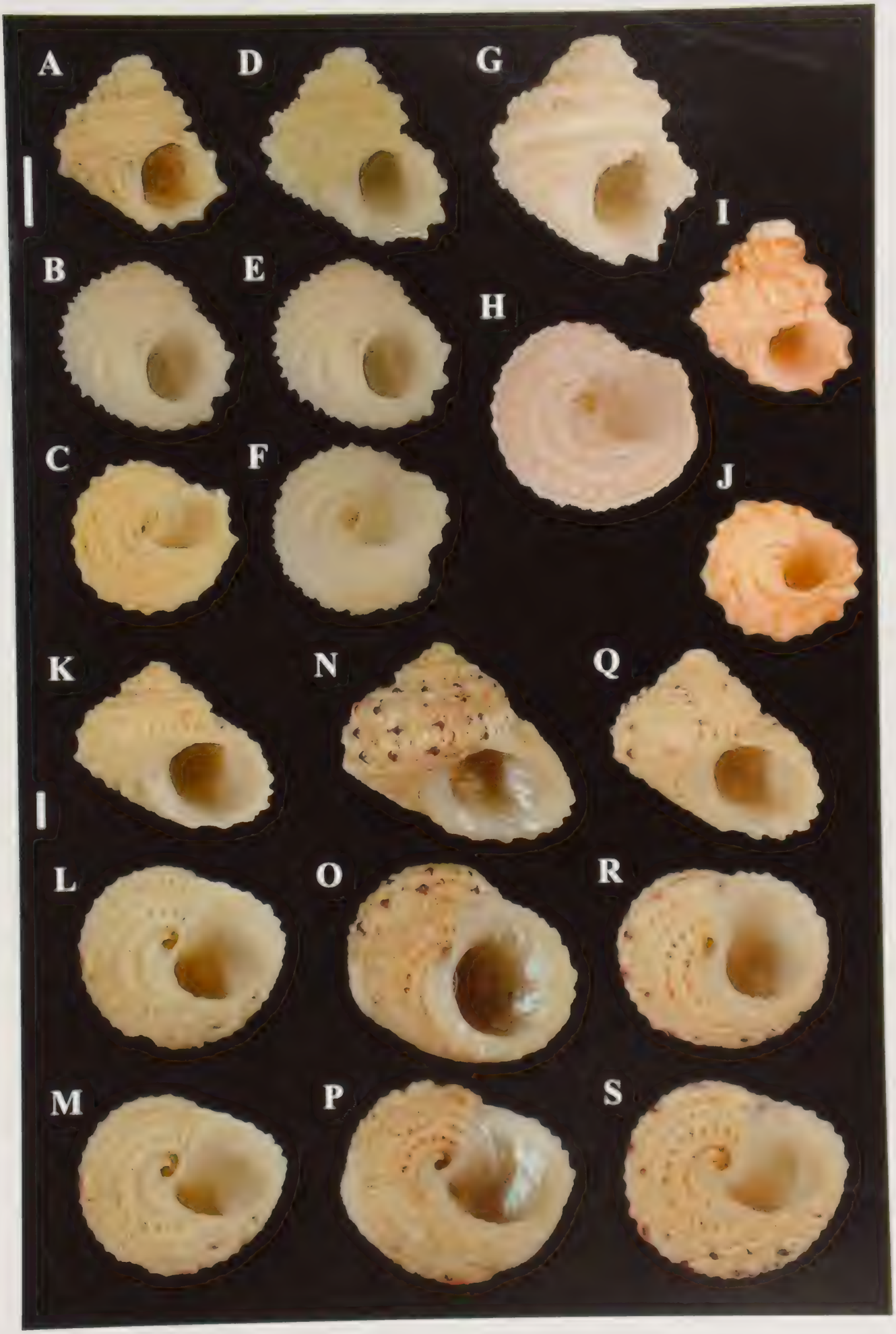
	TW	H	W	HA	H/W	H/HA
holotype	4	4.1	4.8	1.9	0.85	2.16
paratype 1	4.7	5.6	6.3	2.7	0.89	2.07
paratype 2	4	4	4.9	2.2	0.82	1.82
paratype 3	4.4	5.1	6	2.8	0.85	1.82
paratype 4	3.9	4.7	5.1	2.4	0.92	1.96

Table 4. *Vaceuchelus cavernoides* n. sp.: Shells measurements in mm for types.

Discussion. The new species is rather close to *Vaceuchelus cavernosus* (Sowerby III, 1905) from Ceylon (nowadays Sri Lanka), of which two different NHMUK syntypes are figured by Kaicher (1990: card # 5781) and by Herbert (2012: figs. 70A-B). The main differences of this species with *V. cavernoides* are a greater size (height up to 7.3 mm), a higher spire with a greater H/W ratio (about 1), primary cords not so prominent on the last whorls and no visible Si.
There is also a huge gap between the large area where the samples of the new species were collected and the type locality of *V. cavernosus* (Sri Lanka). One can wonder that no book about shells from India, Sri Lanka (and also Vietnam, Thailand, Indonesian, Australia and even Philippines) mention any occurrence of this definitively poorly documented species.

Figure 5 (scale bars: 1 mm).

A-J. ***Vaceuchelus favosus*** (Melvill & Standen, 1896). **A-C.** New Caledonia, Touho, MONTROUZIER, stn 1270, 10-35 m, 2.2 x 2.1 mm. **D-F.** New Caledonia, Koumac, MONTROUZIER, stn 1316, 12 m, 3.2 x 2.9 mm. **G-H.** Wallis Is., MUSORSTOM 7, stn DW 601, 350 m, 3.6 x 3.1 mm. **I-J.** Fiji, MUSORSTOM 10, stn DW1381, 275-430 m, 2.3 x 2.2 mm, dd.
K-S. ***Vaceuchelus cavernoides*** n. sp. **K-M.** New Caledonia, MONTROUZIER, stn 1318, 20-30 m. **N-P.** Holotype MNHN (IM-2000-32778), 4.1 x 4.8 mm. **Q-S.** Paratype MNHN 1 (IM-2000-32779), 5.6 x 6.3 mm. **S-U.** LAGON, stn 1340, 30 m, 5.2 x 5.4 mm.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V. cavernoides n. sp. resembles *V. foveolatus* (A.Adams, 1853) from French Polynesia, Solomon Islands and Philippines (figs 4K–S), of which a NHMUK syntype is figured by Kaicher (1990: card # 5790), but this similar in size species has no Si, has a more elevated spire with a greater H/W ratio (at least about 1, often greater than 1), much more foveolate sculpture on the whorls and a tiny, funnel shaped umbilicus partially covered by a callus.
The new species may be compared to *V. auricatris* Huang & Fu, 2015 from Taiwan Strait (figs 6H-I), but this slightly greater species has a more elevated spire, a spiral cord S1 appearing only on last whorl, a rounded, not elongated, aperture and a wider umbilicus.
The new species may also be compared to *V. ampullus* (Tate, 1893) from eastern and southern Australia, but this much greater species (height up about 11 mm) has much thicker, weaker granular spiral cords and stronger axial ribs, and a narrower or closed umbilicus.

Etymology. Shaped (Ancient Greek: -ωδης, suffix) – with reference to shape of the shell, that is rather similar to the one of *Vaceuchelus cavernosus* (Sowerby III, 1905).

Vaceuchelus phaios n. sp.
Figs 6A–G, Tables 3,5

Type material. Holotype (4.9 x 4.9 mm) MNHN (IM-2000-32781). Paratypes: 5 MNHN (IM-2000-32782, MNHN-IM-2000-32783 as listed below), 1 paratype CV.

Type locality. New Caledonia, Grand Récif de Koumac, MONTROUZIER, stn 1318, 20°41'S, 164°15'E, 20-30 m.

Material examined. New Caledonia. MONTROUZIER: stn 1237, 20°47'S, 165°14'E, 0–1 m, 1 dd, 1 dd juv. – Stn 1251, 20°46'S, 165°13-14'E, 6–15 m, 3 dd. – Stn 1271, 20°45'S, 165°08'E, 5–25 m, 11 lv. – Stn 1278, 20°34'S, 164°16'E, 0-2 m, 2 lv (holotype et paratype MNHN 1 IM-2000-32782). – Stn 1297, 20°35'S, 164°16'E, 3-7 m, 19 dd (with paratypes MNHN 2-5 IM-2000-32783 and paratype CV). – Stn 1299, 20°34'S, 164°13'E, 12-14 m, 1 dd, 1 dd juv. – Stn 1313, 20°39'S, 164°16'E, 33-38 m, 1 dd. – Stn 1314, 20°40'S, 164°15'E, 30-63 m, 1 dd sub, 3 dd juv.
Loyalty Islands. LIFOU 2000: stn 1423, 20°54'S, 167°07'E, 12 m, 1 dd. – Stn 1451, 20°47'S, 167°07'E, 10-21 m, 2 dd, 1 dd juv.

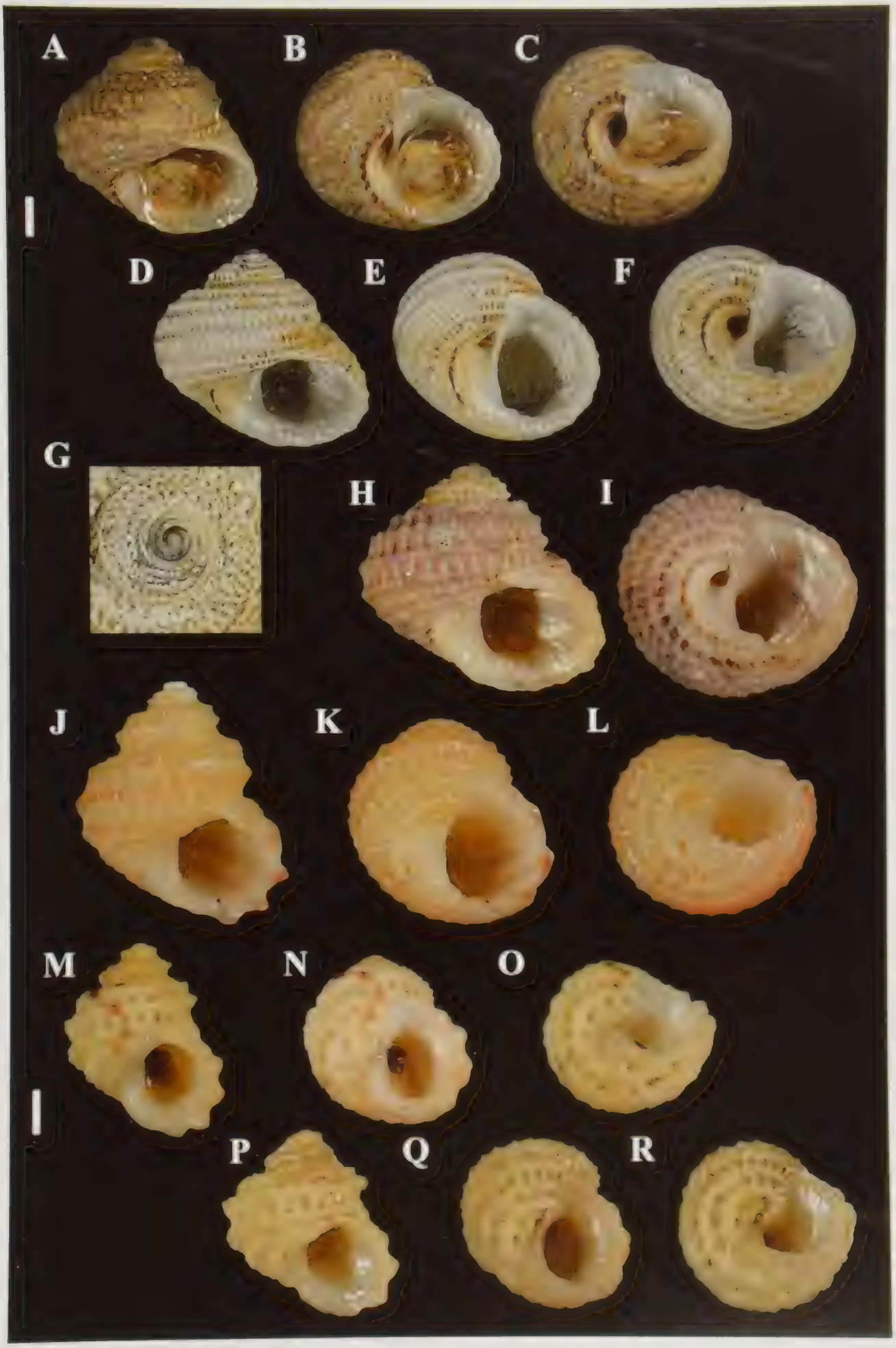
Distribution. New Caledonia, 1-33 m, lv at 2-5 m; Loyalty Islands, 12 m (dd).

Diagnosis. A small, as high as wide or slightly higher than wide, reddish *Vaceuchelus* species with a moderately elevated, weakly cyrtoconoidal spire, a rounded periphery, 5 rather thin, granular spiral cords on penultimate whorl with close axial ribs between them, a moderately convex base with 3 (sometimes 4) strong spiral cords and a rather wide umbilicus.

Description. *Shell* of rather small size for the genus (height up to 5.4 mm, width up to 5.2 mm), as high as wide or slightly higher than wide, moderately elevated, moderately thick, weakly cyrtoconoidal; height 1.0x to 1.2x width, height 1.9x to 2.3x aperture height; umbilicate.
Protoconch about 150 µm, of 1 whorl, under the level of first teleoconch whorl, with a very weak terminal varix.
Teleoconch up to 4.1 convex whorls, with 3 rather thin, similar in size, granular, spiral cords on the penultimate whorl, with an additional, similar in size peripheral cord and a slightly thinner cord intercalated between the two most adapical cords on last whorl; axial prosocline ribs between cords; periphery rounded. Suture visible, not canaliculated.

Figure 6 (scale bars: 1 mm).

A-G. ***Vaceuchelus phaios*** n. sp., New Caledonia, Koumac, MONTROUZIER, stn 1278, 2 m. **A-C.** Holotype MNHN (IM-2000-32781), 4.7 x 4.8 mm. **D-G.** Paratype MNHN 1 (IM-2000-32782), 4.9 x 5.2 mm.
H-I. ***Vaceuchelus auricatris*** Huang & Fu, 2015, Solomon Is., SALOMONBOA 3, stn DW2775, 282-427 m, 6.0 x 6.3 mm.
J-L. ***Vaceuchelus vangoethemi*** Poppe, Tagaro & Dekker, 2006, paratype MNHN 5305, Philippines Mactan Is., Punta Engano, 5.8 x 4.6 mm.
M-R. ***Vaceuchelus rapaensis*** n. sp., French Polynesia, Australes Archipelago, RAPA 2002, stn 38, 2 m. **M-O.** Holotype MNHN (IM-2000-32784), 3.9 x 3.0 mm. **P-R.** Paratype MNHN (IM-2000-32785), 3.2 x 2.6 mm.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First whorl convex, sculptured by about 25 prosocline, smooth, rather thin threads, interspace similar in size to threads; P3 and P2 appearing near mid whorl, P4 close to end of whorl, suprasutural, partly covered by next whorl; all cords thickening quickly. On second whorl, P1 appearing at begin of whorl; axial threads a stronger, distance between them from 1.5x to 2x width of threads. On third whorl, P1, P2 ad P3 similar in size, moderately thick, P4 thinner; S1 appearing between mid and end of whorl; axial threads becoming strong ribs; interspace between ribs somewhat excavated, producing a foveolate pattern on the whole whorl. S2 then S3 appearing on fourth whorl, remaining thinner than the other cords. On last whorl, Pi and S1 making weak keel; T1 appearing between S1 and P2; additional Ti possibly appearing at end of whorl.

Columella only weakly curved, slightly oblique, with a small parietal inducture.

Aperture oval, axially oriented; outer lip thickened internally and weakly flaring, with about 15 elongated denticles inside; inner lip a bit flaring in its basal part, with a strong denticle at meeting point with columella.

Base moderately convex, with 3 or 4 (large specimens) prominent spiral cords similar; innermost cord nearly smooth, thick; other cords granular; thick axial ribs between cords, distance between about 1.5x width of ribs.

Umbilicus deep, moderately wide (about 1/8 base width).

Colour of teleoconch nacreous brown to pinkish white, with first whorl darker and possibly spiral cords on the last whorls lighter; protoconch whitish.

Operculum corneous, multispiral with central nucleus, light brown translucent.

	TW	H	W	HA	H/W	H/HA
holotype lv	4	4.9	4.9	2.5	1.00	1.96
paratype 1	4.1	5.1	5.1	2.6	1.00	1.96
paratype 2	4.1	5.4	5.2	2.5	1.04	2.16
paratype 3	4	4.9	4.8	2.1	1.02	2.33
paratype 4 lv	4	4.8	4	2.2	1.20	2.18
paratype 5	3.6	3.8	3.7	2	1.03	1.90
paratype 6 CV	3.8	4.3	4.1	2.3	1.05	1.87

Table 5. *Vaceuchelus phaios* n. sp.: Shells measurements in mm for types.

Discussion. The new species is slightly resembles *Vaceuchelus cavernoides* n. sp. from western Indo-Pacific (figs 4K-S) but this slightly greater species is more depressed, has much thicker, much prominent spiral cords, a transversally elongated aperture without denticles inside and an inner basal spiral cord sinking into the umbilicus.

Etymology. Brown (Ancient Greek: φαιος, α, ον) - with reference to the background colour of the shell.

Vaceuchelus rapaensis n. sp.
Figs 6M–R, Tables 3,6

Type material. Holotype (3.9 x 3.0 mm) MNHN (IM-2000-32784). Paratypes: 5 MNHN (IM-2000-32785), 1 paratype CV.

Type locality. French Polynesia, Australes Archipelago, Rapa Island, north of Anatakuri Bay, RAPA 2002, stn 38, 27°37'S, 144°18'W, 2 m.

Material examined. French Polynesia, Australes Archipelago, Rapa Island. RAPA 2002: stn 10, 27°34'S, 144°23'W, 16-18 m, 2 dd, 1 dd sub, 3 dd juv. – Stn 11, 27°37'S, 144°18'W, 2 m, 1 dd. – Stn 13, 27°36'S, 144°19'W, 2 m, 1 dd juv. – Stn 19, 27°38'S, 144°19'W, 3 m, 1 dd, 1 dd juv. – Stn 20, 27°35'S, 144°23'W, 5 m, 1 lv, 2 dd juv. – Stn 21, 27°34'S, 144°21'W, 5 m, 6 dd, 2 dd sub, 3 dd juv. – Stn 21, 27°34'S, 144°21'W, 5 m, 1 dd sub. – Stn 25, 27°38'S, 144°19'W, 3 m, 1 dd. – Stn 27, 27°39'S, 144°19'W, 6 m, 3 dd. – Stn 27, 27°39'S, 144°19'W, 6 m, 2 dd sub. – Stn 29, 27°34'S, 144°21'W, 2-4 m, 1 dd. – Stn 32, 27°35'S, 144°23'W, 15-20 m, 1 dd. – Stn 38, 27°37.4'S, 144°18.4'W, 2 m, 15 lv (with holotype and paratypes), 3 lv juv. – Stn 44, 27°36'S, 144°18'W, 30 m, 3 dd juv. – Stn 51, 27°36'S, 144°21'W, 1-1.5 m, 1 dd sub. – Stn 53, 27°37'S, 144°20'W, 1-5 m, 1 dd, 1 dd juv. – Stn 60, 27°37'S, 144°19'W, 1-1.5 m, 2 dd juv. – Stn 61, 27°37'S, 144°19'W, 10-15 m, 2 dd, 2 dd juv. – Stn 67, 27°35'S, 144°22'W, 3-4 m, 4 dd sub. – Stn 68, 27°35'S, 144°21'W, 1-4 m, 1 dd sub. – Stn 69, 27°38'S, 144°19'W, 3-4 m, 2 dd juv. – Stn 70, 27°37'S, 144°20'W, 15-20 m, 6 dd, 3 dd sub, 1 dd juv. – Stn 81, 27°40'S, 144°19'W, intertidal zone, 1 dd.

Distribution. French Polynesia, Australes Archipelago, Rapa Island, 1-30 m, lv at 2-5 m.

Diagnosis. A small whitish *Vaceuchelus* species with a moderately elevated, cyrtoconoidal spire, a subangular periphery, 3 strong, granular spiral cords on penultimate whorl, making keel with strong axial

ribs between them giving a foveolate pattern, a weakly convex base with 3 strong spiral cords and a narrow, sometimes closed, umbilicus .

Description. *Shell* of rather small size for the genus (height up to 3.9 mm, width up to 3.0 mm), slightly higher than wide, rather thick, cyrtoconoidal; spire moderately elevated, height 1.0x to 1.3x width, 1.9x to 3.2x aperture height; narrowly umbilicate or anomphalous.

Protoconch about 120-150 µm, of 1 whorl, at the same level as first teleoconch whorl, with a thin terminal varix.

Teleoconch up to 4 moderately convex whorls, with 3 thick, similar in size, granular, spiral cords and an additional thinner sutural on last whorl; strong axial prosocline ribs between cords; subangular periphery. Suture visible, not canaliculated.

First whorl convex, sculptured by about 40 prosocline, smooth, thin threads; interspace between smaller than width of threads; P3 appearing at mid whorl, thickening quickly. On second whorl, P3 strong, making a median keel; P4 emerging from suture at begin of whorl, P2 appearing at mid whorl; axial threads of adapical part a bit stronger, distance between similar in size to threads; threads of abapical part between Pi much stronger, less numerous than adapical threads. On third whorl, P3 moving abapically, P2 more or less median; axial threads between suture and P2 still rather thin, strongly prosocline; Pi and threads between them very strong, making a foveolate pattern; threads becoming ribs, only weakly prosocline and connecting beads of cords; distance between cords smaller to cords thickness. On last whorl, P1 possibly appearing, subsutural, rather weak; P2, P3 and P4 similar in strength, each making keel and giving a tricarinated shape to the whorl; distance between the three abapical PI about 2x width of cords, distance between abapical ribs about 2x width of ribs; S1 possibly appearing at end of whorl.

Columella more or less straight, vertical.

Aperture almost circular to weakly elliptical, without denticles; outer lip thickened internally and weakly flaring, largely crenulated by inner folds corresponding to external spiral cords; inner lip flaring in its basal part.

Base weakly convex, with 3 spiral cords similar to the main Pi of the last whorl, the innermost one possibly partly or even fully hidden by columellar callus; distance between cords about 1.5w width of cords; strong axial ribs between them, producing the same foveolate pattern as on the last whorl.

Umbilicus narrow, usually partly covered by a narrow callus, possibly fully closed on mature shells.

Colour of teleoconch yellowish nacreous white; protoconch white.

Operculum corneous, multispiral with central nucleus, light brown.

	TW	H	W	HA	H/W	H/HA
holotype	4	3.9	3	1.5	1.3	2.6
paratype 1	3.8	3.2	2.6	1	1.2	3.2
paratype 2	3.9	2.9	2.6	1.3	1.1	2.2
paratype 3	3.8	3.4	2.6	1.3	1.3	2.6
paratype 4	4	2.7	2.6	1.1	1.0	2.5
paratype 5	3.5	2.8	2.2	1.5	1.3	1.9
paratype 6	3.3	2.5	2.4	1.3	1.0	1.9

Table 6. *Vaceuchelus rapaensis* n. sp.: Shells measurements in mm for types.

Discussion. The new species is rather close to *Vaceuchelus favosus* (Melvill & Standen, 1896) from Coral sea (figs 5A–J), but this similar in size species has weaker and more numerous abapical axial threads, lacks the thin, adapical, strongly prosocline threads different from the abapical ribs and has an open wide umbilicus.

V. rapaensis n. sp. remind a little of *V. foveolatus* (A.Adams, 1853) from French Polynesia (figs 4K–S) but this larger species for a similar number of whorls is more depressed, has a P1 appearing much earlier, all the axial ribs similar on last whorls and denticles in the aperture.

V. rapaensis n. sp. may also be compared to *V. clathratus* (A.Adams, 1853) from the Philippines, but this much larger species for a similar number of whorls is more elevated and has a very different P2, thinner and more numerous abapical axial ribs and a closed umbilicus.

Remarks. Apart a relative smaller size, there are no differences between *V. clathratus* (A.Adams, 1853), of which two different NHMUK syntypes are figured by Kaicher (1990: card # 5789) and by Herbert (2012: figs. 70:C-D), and *V. vangoethemi* Poppe, Tagaro & Dekker, 2006 from the Philippines (figs 6J-L). This is probably the reason of the unexpected lack of *V. clathratus* noted by Poppe et al. (2006), although they noted that Kosuge & Chino (1998) mentioned it. This lead to

conclude that *V. vangoethemi* has to be considered a synonym of *V. clathratus*.

Etymology. Named after the type locality.

Genus ***Herpetopoma*** Pilsbry, 1890.
Type species: *Euchelus scabriusculus* A.Adams & Angas in Angas, 1867 (by original designation) - Recent, Australia.

Remarks. The main features of the *Herpetopoma* species are ridge-like denticles inside the outer lip, a basal columellar tooth and another tooth on the basal lip near the columella, the two teeth making an U-shaped notch (Herbert, 2012). Considering the type species, Herbert add to this features an open umbilicus, characterizing *Herpetopoma sensu stricto*. I use here an extending characterization for a *Herpetopoma sensu lato* in which Herbert locate for instance *H. naokoae* Poppe, Tagaro & Dekker, 2006.

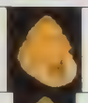
Herpetopoma	shell shape	size (mm)	number of cords on penul-timate whorl	Pi appearing simulta-neously ?	which Si, Ti present ?	base shape	num-ber of cords on base	periphe ry shape	open umbili -cus ?	frontal view
gemmatum	conical to sl. cyrtoco-noidal	8x7	8-10	P1 a bit later	S1, S2, S3, + S4; T1, T2 + poss Ti	convex	4-5	roun-ded	Y	
instrictum	conical	12x10	4-5	+/- Y	S1; T1	w. convex	5-6	roun-ded to sub-angular	Y	
xeniolum	conical	4.5x 3.5	5	Y	S2,S4	mod. convex	6-8	roun-ded	N	
pantantoi n. sp.	conical	5.6x 6.3	4	Y	S4	almost flat	5	sub-angular	N	
verruca	sl. cyrtoco-noidal	3.2x 2.7	3	P1 a bit later	S4 + S1, S2	convex	4	roun-ded	N	
ludiviniae	sl. cyrtoco-noidal	4.4x 3.4	3	Y	-	convex	4	roun-ded	N	
poichilum	conical	4.8x 4.3	4	Y	S4	convex	5	sub-angular	N or Y nar-row	
vitilevuense n. sp.	cyrtoco noidal	3.1x 2.4	3	Y except P4	-	convex	4	roun-ded	N	
naokoae	sl. cyrtoco-noidal	3.5x3	4	P1 later	S4	mod. convex	5	roun-ded	N	
hivaoaense n. sp.	conical	4x3	3	N: P3 + P2 + P1 + P4	S1, S2	w. convex	3	sub-angular	Y	
corrugatum	conical to sl. cyrtoco-noidal	3.8x 3.7	5	Y	S1, S2, poss. S3	mod. convex	3	sub-angular	Y	
rubrum	cyrtoco-noidal	8.5x8	8	P1 later	S1, S2, S3, + S4; T1, T2	convex	4-5	roun-ded	Y	

Table 7. Comparison of conchological features of small central Indo-Pacific *Herpetopoma s. l.* species (sl. = slightly, mod. = moderately, poss. = possible, w = weakly).

Herpetopoma gemmatum (Gould, 1845)
Figs 7A–K, Table 7

Trochus gemmatus Gould, 1845: 27, pl.15, fig.10. Type locality: Sandwich Islands (nowadays Hawaiian Islands).
Monodonta fischeri Montrouzier in Souverbie & Montrouzier, 1866: 142, pl. fig. 7. Syn.
Herpetopoma fischeri (Montrouzier in Souverbie & Montrouzier, 1866) – Kaicher, 1990: card #5704. Syn.
Euchelus gemmatus (Gould, 1845) – Jansen, 1994: 63, pl.1, figs. 5-6.
Herpetopoma fischeri (Montrouzier in Souverbie & Montrouzier, 1866) – Herbert, 1996: 411-412, figs. 1-2.
Herpetopoma gemmata (Gould, 1845) – Vilvens & Héros, 2003: 62, fig.6.
Euchelus gemmatus – Kay, 1979: 51, figs 13, 14B.
Herpetopoma fischeri (Montrouzier in Souverbie & Montrouzier, 1866) – Vilvens & Héros, 2003: 62, fig7.
Herpetopoma gemmatum – Severns, 2011: 44, pl. 6, fig 5.
Herpetopoma gemmatum – Herbert, 2012: 433, 439.

Material examined. New Caledonia. CHALCAL: stn DW60, 21°49'S 159°28'E, 45 m, 1 dd. – CORAIL 2: stn DW84, 19°12'S 158°57'E, 16-26 m, 1 dd sub. – BATHUS 1: stn DW692, 20°35'S, 164°59'E, 140-150 m, 2 dd. – Stn DW1233, 22°24'S, 166°48'E, 45-50 m, 1 dd sub. — MONTROUZIER: stn 1237, 20°47'S, 165°14'E, 0–1 m, 2 dd juv. – Stn 1242, 20°46.2'S, 165°14.5'E, 0-2 m, 1 dd sub. – Stn 1238, 20°47'S, 165°13'E, intertidal zone, 2 lv. – Stn 1254, 20°46'S, 165°15'E, 7 m, 4 dd sub, 3 dd juv. – Stn 1255, 20°43'S, 165°08'E, 11 m, 20 dd sub, 10 dd juv. – Stn 1259, 20°45'S, 165°14'E, 15–35 m, 9 dd sub, 9 dd juv. – Stn 1259, 20°45'S, 165°14'E, 15–35 m, 4 dd juv. – Stn 1266, 20°40'S, 165°15'E, 10-15 m, 1 dd. – Stn 1268, 20°45'S, 165°08'E, 9–11 m, 1 dd sub. – Stn 1268, 20°45'S, 165°08'E, 9–11 m, 15 dd sub, 1 dd juv. – Stn 1269, 20°35'S, 165°08'E, 15–20 m, 20 dd. – Stn 1270, 20°45'S, 165°17'E, 10-35 m, 4 dd, 29 dd sub. – Stn 1271, 20°45'S, 165°08'E, 5–25 m, 19 dd. – Stn 1272, 20°50'S, 165°20'E, 10 m, 10 dd sub, 20 dd juv. – Stn 1273, 20°50'S 165°23'E, 20 m, 1 dd, 9 dd sub. – Stn 1284, 20°34'S, 164°11'E, intertidal zone, 5 lv sub, 25 lv juv. – Stn 1289, 20°29'S, 164°10'E, intertidal zone, 3 dd, 1 dd juv. – Stn 1291, 20°22'S, 164°07'E, intertidal zone, 1 dd sub. – Stn 1298, 2-4 m, 20°35'S, 164°17'E, 2 dd sub. – Stn 1316, 20°40'S, 164°11'E, 12 m, dd, 5 dd sub, 15 dd juv. – Stn 1318, 20°41'S, 164°15'E, 20-30 m, 1 dd, 4 dd sub, 3 dd juv. – Stn 1319, 20°45'S, 164°15.5'E, intertidal zone, 10 dd, 1 dd juv. – Stn 1331, 55-57 m, 20°40'S, 164°11'E, 1 dd sub. – Stn 1346, 22°22'S, 166°16'E, 5-6 m, 1 dd, 1 dd sub. – Stn 1350, 22°18'S, 166°20'E, 3-6 m, 1 dd, 3 dd sub, 1 dd juv. – Stn 1352, 22°22'S, 166°16'E, 27-35, 1 dd, 3 dd sub, 10 dd juv. – Stn 1354, 22°22'S, 166°16'E, 27-37 m, 4 dd sub, 8 dd juv. – Stn 1357, 22°30'S, 166°26'E, 25-35 m, 1 dd. – Stn 1362, 22°21'S, 166°25'E, 6-8 m, 2 dd sub. – Stn 1371, 22°20'S, 166°18'E, 12-16 m, 1 dd, 5 dd sub, 4 dd juv. – Stn 1373, 22°20'S, 166°13'E, 9-10 m, 1 dd. – PALEO-SURPRISE: stn DW1381, 18°29'S, 163°04'E, 32-36 m, 1 dd. – NORFOLK 1: stn DW1727, 23°17'S, 168°14'E, 190-212 m, 1 dd juv.

Loyalty Islands. LIFOU 2000: stn 1413, 20°55'S, 167°05'E, 3-10 m, 2 dd. – Stn 1420, 20°48'S, 167°09'E, 4-5 m, 3 dd juv. – Stn 1421, 20°52'S, 167°09'E, 4 m, 1 dd. – Stn 1422, 20°47'S, 167°07'E, 4 m, 2 dd. – Stn 1423, 20°54'S, 167°07'E, 12 m, 2 dd, 3 dd juv. – Stn 1424, 20°55'S, 167°03'E, 4 m, 1 dd. – Stn 1429, 20°485'S, 167°07'E, 8-18 m,3 dd, 1 dd sub. – Stn 1432, 20°54'S, 167°03'E, 12-32 m, 3 dd. – Stn 1434, 20°53'S, 167°08'E, 5-20 m, 2 dd, 1 dd juv. – Stn 1435, 20°55'S, 167°00'E, 5-30 m, 3 dd, 6 dd juv. – Stn 1436, 20°56'S, 167°04'E, 10-20 m, 2 dd. – Stn 1444, 20°55'S, 167°05'E, 9-20 m, 1 dd. – Stn 1449, 20°46'S, 167°02'E, 17 m, 1 dd juv. – Stn 1450, 20°46'S, 167°02'E, 27-31 m, 2 lv juv. – Stn 1451, 20°47'S, 167°07'E,10-21 m, 2 dd, 1 dd juv. – Stn 1453, 20°55'S, 167°02'E, 21-30 m, 1 dd. – Stn 1453, 20°55'S, 167°02'E, 21-30 m, 2 dd juv. – Stn 1454, 20°57'S, 167°02'E, 15-18 m, 1 dd juv. – Stn 1456, 20°49'S, 167°10'E, 25-30 m, 1 dd juv. – Stn 1457, 20°47'S, 167°03'E, 5-10 m, 3 dd, 1 dd juv. – Stn 1461, 20°54'S, 167°02'E, 100-120 m, 1 dd. – Stn DW1650, 20°54'S, 167°02'E, 120-250 m, 1 dd.

Fiji. SUVA 4: DW09, 18°21'S, 178°06'E, 37-41 m, 2 dd. – Stn DW10, 18°21'S, 178°08'E, 39-43 m, 1 dd sub. – Stn DW12, 18°21'S, 178°10'E, 39 m, 4 dd sub. – Stn DW16, 18°26'S, 178°07'E, 32-36 m, 2 dd. – Stn DW22, 18°22'S, 177°59'E, 32-36 m, 3 dd. – Stn DW25, 18°27'S, 178°01'E, 48-51 m, 2 dd. – Stn DW74, 17°49'S, 177°12'E, 38 m, 1 dd.

Wallis and Futuna Islands. MUSORSTOM 7: stn DW494, 14°19'S 178°03'W, 100-110 m, 1 dd. – Stn DW601, 13°19'S, 176°17'W, 350 m, 1 dd sub, 1 dd juv.

French Polynesia, Australes Archipelago. BENTHAUS: DW1961, 23°21'S, 149°34'W, 470 800 m, 2 dd sub.

Vanuatu. SANTO 2006: stn DB65, 15°26'S, 167°13'E, 13 m, 1 dd.

Solomon Islands. SALOMON 1: stn DW1742, 11°29'S, 159°57'E, 366-421 m, 1 dd juv. – Stn DW1762, 8°40'S, 160°04'E, 396-411 m, 1 dd juv. – Stn CP1764, 8°37'S, 160°07'E, 1327-1598 m, 1 dd. – SALOMON 2: stn DW2198, 7°43'S, 158°30' E, 273-300 m, 1 dd.

Indonesia, Tanimbar Islands. KARUBAR: stn DW49, 08°00'S, 132°59'E, 206-210 m,1 dd.

Philippines. PANGLAO 2004: stn B10, 09°37'N, 123°46'E, 3-14 m, 1 dd, 1 dd juv. – Stn S13, 09°37'N, 123°52'E, 8-15 m, 2 dd. – Stn B38, 09°31'N, 123°41'E, 17-18 m, 2 dd. – PANGLAO 2005: stn DW2340, 09°29'N, 123°44'E, 271-318 m, 1 dd juv. – Stn DW2401, 09°31'N, 123°40'E, 397-410 m, 2 dd.

Distribution. New Caledonia, 1-190 m, lv at 0-1 m; Loyalty Islands, 4-120 (dd); Fiji, 36-48 m (dd); Wallis and Futuna Islands, 110-350 m (dd); French Polynesia, Australes Archipelago, 800 m (dd); Vanuatu, 13 m (dd); Solomon Islands, 300-1327 m (dd); Indonesia, Tanimbar Islands, 206-210 m (dd); Philippines, 14-397 m (dd).

Remarks. The main characteristics of this species are:

- height up to 8 mm, width up to 7 mm;
- conical, with a rather elevated spire;
- teleoconch of about 5 convex whorls with at least 8 granular, rather thin, beaded spiral cords on penultimate whorl, up to 10-12 on last whorl; beads of cords rounded and small;
- first whorl with prosocline, thick axial threads; P2 and P3 after mid first whorl, P1 at begin of 2nd whorl; S1 and S2 at 3rd whorl; S3, T1 and T2 at 4th whorl, T1 between P1 and S1 and T2 between S1 and P2; P4 and S4 visible on last whorl; additional Ti cords possibly appearing;
- columella with one strong basal columellar tooth with a second weaker upper tooth; an other tooth on basal lip, a deep U-shaped notch between the two teeth; a basal glossy expansion bordering the aperture bearing short ridges.
- denticles inside the outer lip of the aperture;
- 4, sometimes 5, spiral cords on the base;
- moderately wide umbilicus, with perspective to apex, partly covered by a callus;
- whitish with reddish spots.

I follow here Jansen (1994) and Herbert (1996) who consider that *Herpetopoma fischeri* (Montrouzier in Souverbie & Montrouzier, 1866) is a likely synonym of *H. gemmatum*. I can't agree with Poppe et al. (2006) who, ignoring apparently *H. gemmatum*, consider *H. fischeri* as a synonym of *H. exasperatum* (A. Adams, 1853) from the Philippines (maybe by comparison with juvenile or subadult samples of *H. fischeri* = *H. gemmatum*). For a similar size, *H. exasperatum* is indeed clearly much more depressed than *H. gemmatum*, with P2 and P3 producing a double keel, giving a cylindrical shape to the abapical part of the body whorl, instead of the convex shape of *H. gemmatum* whorls; moreover, *H. gemmatum* has similar in size spiral cords on the body whorl, instead of spiral cords of alternating size.

Herpetopoma instrictum (Gould, 1849)
Figs 7L–T, Table 7

Trochus (*Monodonta*) *instrictus* in 1846–50: 107 (1852: 190, pl. 13, fig. 225a–c). Type locacility: Pacific Islands.
Monodonta alveolata A.Adams, 1853: 176. Syn.
Monodonta bourcierei Crosse, 1863: 178, pl. 4, fig. 6. Syn.
Euchelus instrictus – Kaicher, 1990: card # 5705.
Euchelus alveolatus – Kaicher, 1990: card # 5706.
Euchelus bourcieri – Kaicher, 1990: card # 5707. Syn. (misspelling for *bourcierei*).
Herpetopoma instricta – Wilson, 1993: 68.
Herpetopoma instricta – Vilvens & Héros, 2003: 61, fig. 5.
Herpetopoma instrictum – Poppe, Tagaro & Dekker, 2006: 37, pl. 10, fig. 4.
Herpetopoma instrictum – Herbert, 2012: 429-433, fig. 23:A-H.

Material examined. New Caledonia. MONTROUZIER: stn 1245, 20°45'S, 165°16'E, intertidal, 24 dd, 2 dd sub, 7 dd juv. – Stn 1254, 20°46'S, 165°15'E, 7 m, 1 dd. – Stn 1270, 20°45'S, 165°15'E, 10-35 m, 1 dd, 1 dd sub, 2 dd juv. – Stn 1271, 20°45'S, 165°08'E, 5–25 m, 1 dd. – Stn 1272, 20°50'S 165°20'E, 10 m, 1 dd sub. – Stn 1279, 20°35'S, 164°16'E, intertidal zone, 1 dd, 2 dd juv. – Stn 1284, 20°34'S, 164°11'E, intertidal zone, 3 dd. – Stn 1297, 20°35'S, 164°16'E, 3-7 m, 1 dd sub. – Stn 1316, 20°40'S, 164°11'E, 12 m, 1 dd sub.
Loyalty Islands. BIOGEOCAL: stn DW307, 20°35'S, 166°55'E, 470-480 m, 5 dd. – BATHUS 4: stn DW929, 18°52'S, 163°23'E, 502-516 m, 1 dd. – LIFOU 2000: stn 1435, 20°55'S, 167°00'E, 5-30 m, 1 dd juv. – Stn 1438, 20°48'S, 167°09'E, 16 m, 1 dd. – Stn 1436, 20°56'S, 167°04'E, 10-20 m, 1 dd juv. – Stn 1441, 20°46'S, 167°02'E, 20 m, 1 dd juv.

Distribution. New Caledonia, 1-12 m (dd); Loyalty Islands, 16-502 m.

Figure 7 (scale bar: 5 mm).

A-K. ***Herpetopoma gemmatum*** (Gould, 1845). **A-C.** New Caledonia, Koumac, MONTROUZIER, stn 1319, 7.9 x 6.9 mm. **D-I.** Loyalty Islands, Lifou, LIFOU 2000, stn 1429, 8-18 m. **D-F.** 7.3 x 6.2 mm. **G-I.** Juvenil, 5.0 x 5.4 mm. **J-K.** Broken specimen showing internal structure, New Caledonia, Touho, MONTROUZIER, stn1266, 10-15 m, 6.8 x 5.6 mm.
L-T. ***Herpetopoma instrictum*** (Gould, 1849), New Caledonia. **L-N.** Koumac, MONTROUZIER, stn 1284, intertidal, 8.9 x 7.5 mm. **O-Q.** Touho, MONTROUZIER, stn 1254, 7 m, 9.2 x 7.7 mm. **R-T.** Subadult, Touho, MONTROUZIER, stn 1272, 10 m, 6.7 x 6.6 mm

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Remarks. The main features of this species are:
- height up to 12 mm, width up to 10 mm;
- spire rather elevated, conical; sculpture foveolate;
- protoconch of about 180-200 µm;
- teleoconch of up to 6.5 almost flat to weakly convex whorls; 4 to 5 granular spiral cords on the penultimate whorl, 6 on the last whorl; first whorl with rather strong prosocline threads, distance between threads similar in size to threads; P2 and P3 appearing at mid first whorl, P1 at end of first whorl, S1 at half of third whorl, T1 at half of fourth whorl, between P1 and S1; on last whorl, P4 peripheral, cords similar in size except P3 and P2 slightly stronger; distance between cords 1x to 1.5x size of cords;
- columella with a low bulge in the mid region and a small, peg-like, basal tooth;
- aperture D-shaped, with a dozen ridge-like denticles; margin of outer lip somewhat flaring; U-shaped notch between the basal tooth and first denticle of basal part of outer lip;
- base weakly convex to almost flat, with 5 to 6 strong, granular spiral cords, the innermost forming umbilical margin; distance between cords similar to size of cords;
- large umbilicus, funnel shaped with convex wall;
- light brown with reddish brown markings.

All the New Caledonian samples are dead taken; many of them lack the labral denticles in the aperture except one or two weak ones near the columella.

Herpetopoma xeniolum (Melvill, 1918)
Figs 8A–I, Table 7

Euchelus xeniolum Melvill, 1918: 154, pl. 5, fig. 27. Type locality: Chabar, Gulf of Oman [= Chah Bahar, Iran],
Turcica (Perrinia) waiwailevensis Ladd, 1982: 23, pl. 24, figs 10–13. Syn.
Herpetopoma eboreum Vilvens & Héros, 2003: 61-64, figs. 1-4. Syn.
Herpetopoma eboreum – Poppe, Tagaro & Dekker, 2006: 36, pl. 10, fig.2.
Herpetopoma xeniolum – Herbert, 2012: 444-446, fig. 36, 37:A-H, 38:A-C.

Material examined. New Caledonia. LAGON: stn 830, 20°49'S, 165°19'E, 105-110 m, 50 dd. –BATHUS 1: stn DW692, 20°35'S, 164°59'E, 140-150 m, 2 dd.
Fiji. MUSORSTOM 10: CP1376, 18°19'S, 178°09'E, 497-504 m, 1 dd.
Tonga Islands. BORDAU 2: stn DW1567, 20°02'S, 175°19'W, 351-356 m, 2 dd.
Vanuatu. SANTO 2006: stn DS99, 15°33'S, 167°17'E, 100-105 m, 1 dd. – Stn DS103, 15°31'S, 167°16'E, 70-80 m, 1 dd.
Indonesia. KARUBAR: stn DW29, 05°36'S, 132°56'E, 181-184 m, 5 dd. – Stn DW49, 08°00'S, 132°59'E, 210-206 m, 1 lv.
Solomon Is. SALOMON 1: stn DW1767, 8°19'S, 160°40'E, 98-200 m, 3 dd. – Stn DW1850, 10°28'S, 161°59'E, 139-261 m, 1 dd.
Philippines. AURORA 2007: stn DW2738, 16°04'N, 121°56'E, 111-113 m, 2 dd. – Stn DW2757, 15°54'N, 121°50'E, 169-176 m, 1 dd, 3 dd sub.

Distribution. New Caledonia, 110-140 m (dd); Fiji, 497-504 m (dd); Tonga Islands, 351-356 m (dd); Vanuatu, 80-100 m (dd); Indonesia, Kai Islands, 184-210 m (dd); Solomon Islands, 139-200 m (dd); Philippines, 113-169 m (dd).

Remarks. The main characteristics of this species are:
- height up to 4.5 mm, width up to 3.5 mm;
- elevated, spire rather thick, roundly conical; sculpture cancellate;
- protoconch of about 150 µm;
- teleoconch of 4.5 to 5 convex whorls with 5 granular spiral cords on penultimate whorl; rounded periphery; on 1st whorl, only thin prosocline threads, distance between threads about 1.5x larger than threads; at begin of 2nd whorl, 5 spiral cords (4 Pi and S2) resolving almost simultaneously (one can detect on some specimens P1 dividing into 2 cords but this is visible on other samples); S4 peripheral on last whorl, thinner than the other cords; distance between cords smaller than cords ;
- columella with one basal, small but sharp tooth;
- moderately convex base with 6 to 8 rather thick, nearly smooth to weakly subgranular, spiral cords; interspace between cords as broad as cords;
- strong labral folds all around the outer lip of the aperture;
- no umbilicus;
- light beige to ivory, without maculation.

Herpetopoma pantantoi n. sp.
Figs 8J–O, Tables 7, 8

Type material. Holotype (4.1 x 4.8 mm) MNHN (IM-2000-32786). Paratypes: 4 MNHN (IM-2000-32787), 1 paratype CV.

Type locality. Southern New Caledonia, Norfolk Ridge, NORFOLK 1, stn DW1684, 24°55'S, 168°22'E, 508-541 m.

Material examined. New Caledonia. BIOCAL: stn KG06, 20°35'S, 166°53'E, 735 m, 2 dd. – Stn DW08, 20°34'S, 166°54'E, 435 m, 3 dd. – Stn DW83, 20°35'S, 166°54'E, 460 m, 1 dd. – CHALCAL 2: stn DW72, 24°55'S 168°22'E, 527 m, 1 dd. – SMIB 3: stn DW17, 23°41'S, 167°59'E, 238 m, 1 dd. – VOLSMAR: stn DW38, 22°22'S, 168°44'E, 380-420 m, 1 dd. – BERYX 11: stn DW10, 24°53'S, 168°21'E, 565-600 m, 6 dd. – Stn DW35, 23°33'S, 167°16'E, 550-570 m, 12 dd. – Stn CH41, 23°39'S, 168°00'E, 230-360 m, 7 dd. – SMIB 8: stn DW146-147, 24°55'S, 168°22'E, 508-532 m, 4 dd. – Stn DW153, 24°54'S,

168°22'E, 547-560 m, 1 dd. – Stn DW166, 23°38'S, 167°43'E, 433-450 m, 4 dd. – Stn DW193-196, 23°59'S, 168°21'E-168°23'E, 491-558 m, 11 dd, 1 dd sub, 1 dd juv. – Stn DW201, 23°59'S, 168°21'E, 500-504 m, 1 dd. – BATHUS 1: stn CP654, 21°17'S, 165°57'E, 237-298 m, 1 dd, 2 dd sub, 5 dd juv. – DW838, 23°01'S, 166°56'E, 400-402, 1 dd. – NORFOLK 1: stn DW1666, 23°42'S, 167°44'E, 469-860 m, 5 dd. – Stn DW1684, 24°55'S, 168°22'E, 508-541 m, 7 lv (with holotype and paratypes). – Stn DW1692, 24°56'S, 168°21'E, 507-967 m, 1 dd. – Stn DW1722, 23°18'S, 168°01'E, 540 m, 2 dd. – Stn DW1732, 23°20'S, 168°16'E, 347-1063 m, 8 dd, 3 dd sub, 3 dd juv. – Stn DW1733, 23°56'S, 167°15'E, 427-433 m, 1 dd. –NORFOLK 2: stn DW2036, 23°38'S, 167°39'E, 571-610 m, 14 dd, 4 dd sub. – Stn DW2057, 24°40'S, 168°39'E, 555-565 m, 1 lv. – EBISCO: stn DW2603, 19°36'S, 158°43'E, 568-570 m, 12 dd.

Loyalty Islands. BIOGEOCAL: stn DW291, 20°34'S, 166°54'E, 510-520 m, 1 dd, 1 dd sub, 1 dd juv. – Stn DW307, 20°35'S, 166°55'E, 470-480 m, 2 dd sub. – Stn DW253, 21°32'S, 166°29'E, 310-315 m, 2 dd sub.

Fiji. MUSORSTOM 10: stn DW1334, 16°51'S, 178°14'E, 251-257 m, 1 dd juv

Solomon Islands. SALOMONBOA 3: stn CP2823, 10°27'S, 162°02'E, 240-572 m, 15 dd.

Distribution. New Caledonia, 238-737 m, lv at 541-555 m; Loyalty Islands, 315-510 m (dd); Fiji, 251-257 m (dd); Solomon Islands, 240-572 m (dd).

Diagnosis. A small light brownish *Herpetopoma* species with an elevated, conical spire and a subangular periphery, 4 granular spiral cords on the whorls, a strong columellar basal tooth, strong fold-shape denticles inside the aperture and an almost flat base with 5 spiral cords and without umbilicus.

Description. *Shell* of rather small size for the genus (height up to 5.6 mm, width up to 6.3 mm), higher than wide with a subangular periphery, rather thick, conical; spire elevated, height 1.2x to 1.3x width, 2.3x to 4.3x aperture height; anomphalous.

Protoconch about 150-200 µm, of 1 whorl, with a thin terminal varix.

Teleoconch up to 5.6 weakly convex to almost straight whorls, bearing 4 spiral granular cords similar in size, with an additional smaller peripheral cord on last whorl; nodules from cords at intersections with strong axial prosocline ribs. Suture hardly visible, weakly canaliculated.

First whorl convex, sculptured by about 20 prosocline smooth, rather thin ribs; interspace between similar in size to ribs. On second whorl, primary cords P1, P2, P3 and P4 appearing after mid whorl, granular, similar in size; distance between cords similar in size to cords; axial ribs stronger, connecting beads of cords. On third whorl, cords and ribs much stronger, producing a reticulate pattern; distance between cords smaller to cords thickness.

On next whorls, cords and ribs very strong, producing an almost foveolate pattern; sulcus at sutural level, made by subsutural cord and suprasutural cord of preceding whorl; beads of cords slightly axially elongated.

On last whorl, S4 emerging from suture, thinner than the other cords; P4 peripheral, slightly stronger then other Pi; additional cords possibly appearing, e.g. T1 under P1 and next T2 ender P2 (holotype) or T2 and T3 respectively under P2 and P3 (paratype 1).

Columella straight, almost vertical, with a strong, basal tooth; tooth 45° toward bottom oriented.

Aperture almost circular; outer lip thickened internally and weakly flaring, especially near the columella; 9 or 10 inner fold-shaped labral denticles, innermost separated from basal columella tooth by a U-shaped notch.

Base almost flat, with 5 subgranular to nearly smooth, similar in size spiral cords; distance between cords slightly greater than cords; thin axial threads between spiral cords.

No umbilicus.

Colour of teleoconch pinkish white to light brown ; protoconch pinkish white.

Operculum corneous, multispiral, brown.

	TW	H	W	HA	H/W	H/HA
holotype	4	4.1	4.8	1.9	0.85	2.16
paratype 1	4.7	5.6	6.3	2.7	0.89	2.07
paratype 2	4	4	4.9	2.2	0.82	1.82
paratype 3	4.4	5.1	6	2.8	0.85	1.82
paratype 4	3.9	4.7	5.1	2.4	0.92	1.96
paratype 5 CV	4	4.1	4.8	1.9	0.85	2.16

Table 8. *Herpetopoma pantantoi* n. sp.: Shells measurements in mm for types.

Discussion. The new species is rather close to *Herpetopoma xeniolum* (Melvill, 1918) from Indo-Pacific (figs 8A-I), but this species has more convex whorls, 5 (not 4) spiral cords on penultimate whorl, Pi appearing at the latest at begin of 2nd whorl (not after the mid whorl), a smaller basal columellar tooth, a

more rounded periphery and a more convex base with more numerous spiral cords (6 to 8 instead of at most 5).

H. pantantoi n. sp. may also be compared to *H. naokoae* Poppe, Tagaro & Dekker, 2006 from the Philippines (figs 10G-L), but this species has more convex whorls, a smaller protoconch, P2, P3 and P4 appearing at begin of 2nd whorl while P1 appears later on 3rd whorl, granular, a rounded periphery and a more convex base with the distance between cords smaller then cords.

The new species reminds also *H. norfolkensis* Jansen, 1994 from Norfolk Island (off western Australia), but this similar in size species is more or less as high as wide (H/W ratio from 0.95 to 1.05), has a cyrtoconoidal shape, much more convex last whorls, a different ontogeny of the cords (P3 and P4 first, next P1 and finally P2), a more rounded periphery and only three spiral cords on the base

Etymology. Cords together (Ancient Greek: together = παντα and cord = αντοζ, οι - contracted) - with reference to the spiral cords appearing simultaneously on the second whorl.

Herpetopoma verruca (Gould, 1861)
Figs 9A–U, Table 7

Diloma verruca Gould, 1861: 18. Type locality: Coral Sea, China.

Herpetopoma verruca – Herbert, 2012: 439, fig. 69: E-F.

Material examined. Indonesia, Kai Islands. KARUBAR: stn DW15, 212-221 m, 05°17'S, 132°41'E, 1 dd. – Stn DW18, 05°18'S, 133°01'E, 205-212 m, 5 dd. – stn DW44, 07°52'S, 132°48'E, 291-295 m, 3 dd. – Stn DW49, 08°00'S, 132°59'E, 206-210 m, 4 dd. – Stn DW50, 07°59'S, 133°02'E, 184-186 m, 1 dd.

Solomon Islands. SALOMON 1: stn DW1762, 8°40'S, 160°04'E, 396-411 m, 17 dd, 5dd juv. – SALOMON 2: stn DW2191, 6°51'S, 156°24'E, 182-277 m, 20 dd. – Stn DW2234, 6°51'S, 156°24'E, 182-277 m, 18 dd. – Stn DW2235, 6°51'S, 156°23'E, 162-196 m, 1 dd.

Vanuatu. SANTO 2006: DR89, 15°34'S, 167°17'E, 75 m, 1 dd. – Stn DS99, 15°33'S, 167°17'E, 100-105 m, 2 dd.

New Caledonia. LAGON: stn 830, 20°49'S, 165°19'E, 105-110 m, 35 dd. – MONTROUZIER: stn 1321, 20°457'S, 164°15'E, 90-115 m, 1 dd. – Stn 1323, 20°41'S, 164°15'E, 82-120 m, 3 dd. – BATHUS 1: stn DW692, 20°35'S, 164°59'E, 140-150 m, 2 dd.

Loyalty Islands. MUSORSTOM 6: stn DW406, 20°41'S, 167°07'E, 373 m, 1 dd.

Fiji. BORDAU 1: stn DW1465, 18°09'S, 178°39'W, 290-300 m, 1 dd. – Stn DW1469, 19°.40'S, 178°10'W, 314- 377 m, 4 dd.

South-western Pacific, Wallis Island. MUSORSTOM 7: stn DW601, 13°19'S, 176°17'W, 350 m, 1 dd. – Stn DW610, 13°21'S, 176°09'W, 286 m, 1 dd, 1 dd sub.

Tonga. BORDAU 2: stn DW1523, 21°18'S, 175°00'W, 300-302 m, 2 dd.

Distribution. Indonesia, Kai Islands, 186-291m (dd); Solomon Islands, 196-396 m (dd); Vanuatu, 75-100 m (dd); New Caledonia, 110-140 m (dd); Loyalty Islands, 373 m (dd); Fiji, 300-314 m (dd); Wallis Island, 286-350 m (dd); Tonga, 300-302 m (dd).

Remarks. The main characteristics of this species are:

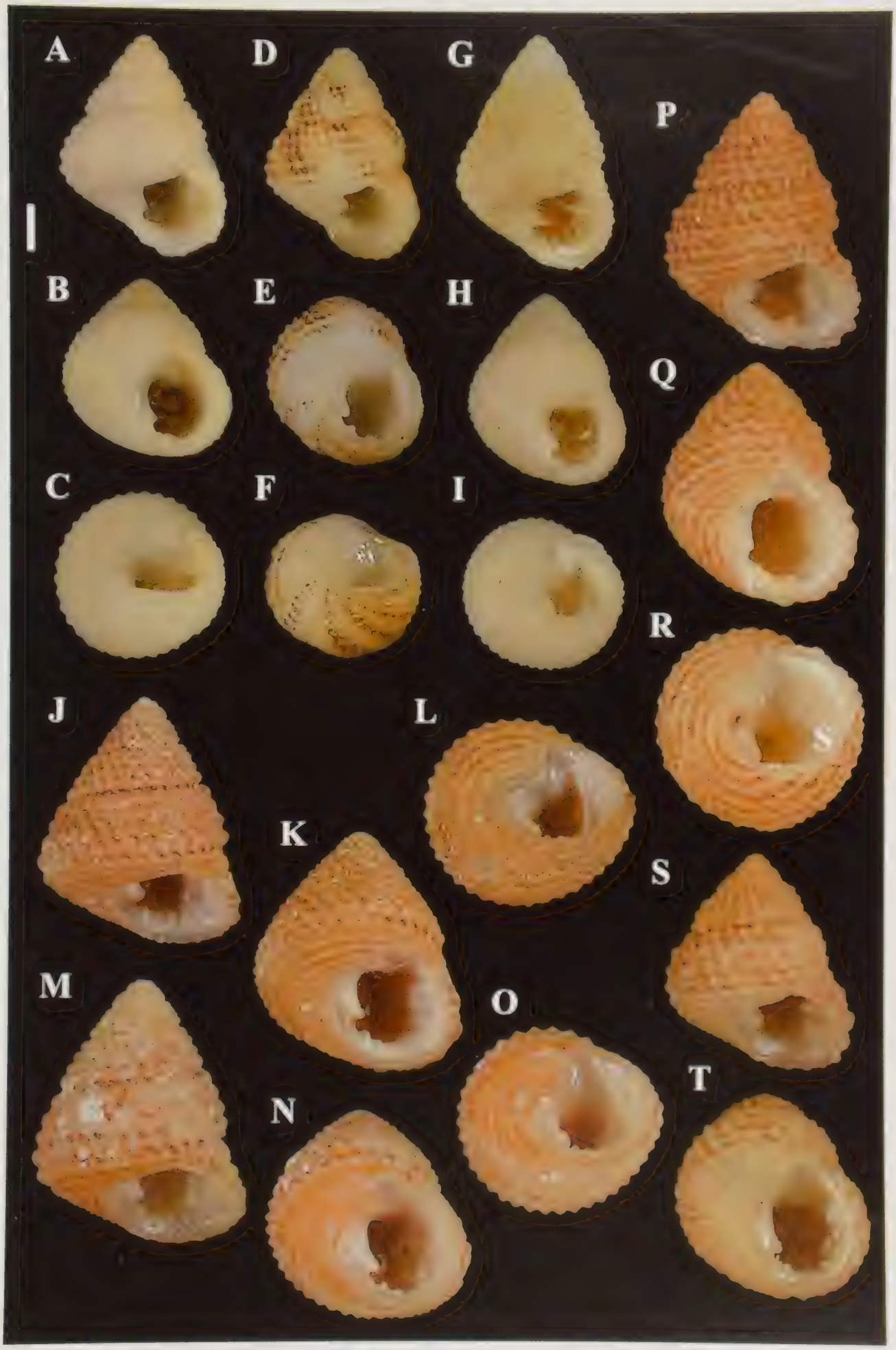
- height up to 3.2 mm, width up to 2.7 mm;
- moderately elevated spire; slightly cyrtoconoidal; sculpture cancellate;
- teleoconch of about 4.5 convex whorls with 3 granular spiral cords on penultimate whorl; rounded periphery; P2 and P3 appearing first, P1 a bit later; on last whorl, P2 and P3 widely spaced, S1 and S2 appearing and S4 peripheral,;
- aperture with denticles all around outer lip;
- columella with one small basal tooth with U-notch below;
- convex base with 4 granular spiral cords; distance between cords 1x to 1.5x the size of cords;
- no umbilicus;
- whitish.

Figure 8 (scale bar: 1 mm).

A-I. ***Herpetopoma xeniolum*** (Melvill, 1918). **A-C.** New Caledonia, Poindimié area, LAGON, stn 830, 105-110 m, 4.2 x 2.8 mm. **D-F.** Vanuatu, SANTO 2006, stn DS99, 100-105 m, 3.5 x 2.4 mm. **G-I.** Tonga Islands, BORDAU 2, stn DW1567, 351-356 m, 4.7 x 3.4 mm.

J-O. ***Herpetopoma pantantoi*** n. sp., southern New Caledonia, Norfolk Ridge. **J-L.** Holotype MNHN (IM-2000-32786), NORFOLK 1, stn DW1684, 508-541 m, 5.2 x 4.2 mm. **M-O.** SMIB 8, stn DW201, 500-504 m, 5.5 x 4.4 mm.

P-T. ***Herpetopoma poichilum*** Vilvens, 2012, BENTHAUS, stn DW1876, 150-160 m. **P-R.** 5.4 x 3.6 mm. **S-T.** 4.6 x 3.8 mm.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Herbert (2012) pointed out that this species, described from "Coral seas, China", is poorly known and that the two widely spaced main spiral cords are distinctive. Using the little available information about this species, it seems difficult to distinct the numerous samples from the lectotype of the USNM: at most can be said that the spiral cords of the whorls seem thinner for some samples than those of the Coral sea type. Considering this impossibility to differentiate the specimens only on a conchological base, *Herpetopoma verruca* seems to be the oldest available name to gather all these samples from Solomon Islands to New Caledonia and even to Tonga Islands. In this last area, the only two sample collected are a little stockier; strangely, the columellar tooth is only fully visible from a three-quarters view.

Herpetopoma ludiviniae
(Poppe, Tagaro & Dekker, 2006)
Figs 9V–X, Table 7

Vaceuchelus ludiviniae Poppe, Tagaro & Dekker, 2006: 48-49, pl. 17, fig. 1-3. Type locality: Punta Engaño, Mactan Island, Philippines.

Material examined. Philippines. PANGLAO 2004: stn P1, 9°36'N, 123°45'E, 90-200 m, 1 dd, 6 dd sub, 2 dd juv. – Stn L50, 9°37'N, 123°46'E, 120 m, 2 dd. – AURORA 2007: stn DW2741, 16°03'N, 121°54'E, 194-203 m, 2 dd. – Stn DW2759, 15°55'N, 121°55'E, 122-139 m, 13 dd, 1 dd juv.

Distribution. Philippines (Mactan, Balicasag and Bohol Islands), 56-250 m (dd - using also data of Poppe et al., 2006).

Remarks. The main characteristics of this species are:
- height up to 4.4 mm, width up to 3.4 mm;
- slightly cyrtoconoidal; rather elevated spire; sculpture cancellate;
- teleoconch of about 4 convex whorls with 3 granular spiral cords on penultimate whorl; rounded periphery; on 1st whorl, only thin prosocline threads; on 2nd whorl, P1, P2 and P3 appearing at begin of whorl, granular, with round beads distinctly separate; distance between cords about two times size of cords; P4 peripheral on last whorl;
- aperture with labral fold-shaped denticles that are the ends of in-running spiral ridges;
- columella with one short basal tooth;
- convex base with 4 granular spiral cords; distance between cords about 1.5 times size of cords;
- no umbilicus;
- cream white.

This species was described by Poppe et al. as a *Vaceuchelus* species, but the typical U-notch under the columellar tooth shows that *Herpetopoma* is a better genus for it. This species seems very close to *Herpetopoma verruca* (Gould, 1861). Comparison of the types of *H. verruca* and *H. ludiviniae* should establish if these two close species are the same one or not. An accurate comparison with *H. elevata* Jansen, 1994 from Queensland should be also needed.

Herpetopoma poichilum Vilvens, 2012
Figs 8P–T, Table 7

Herpetopoma poichilum Vilvens, 2012: 6,8, figs G1-G2, 16-19. Type locality: Society Islands, Tahiti, 455-650 m.

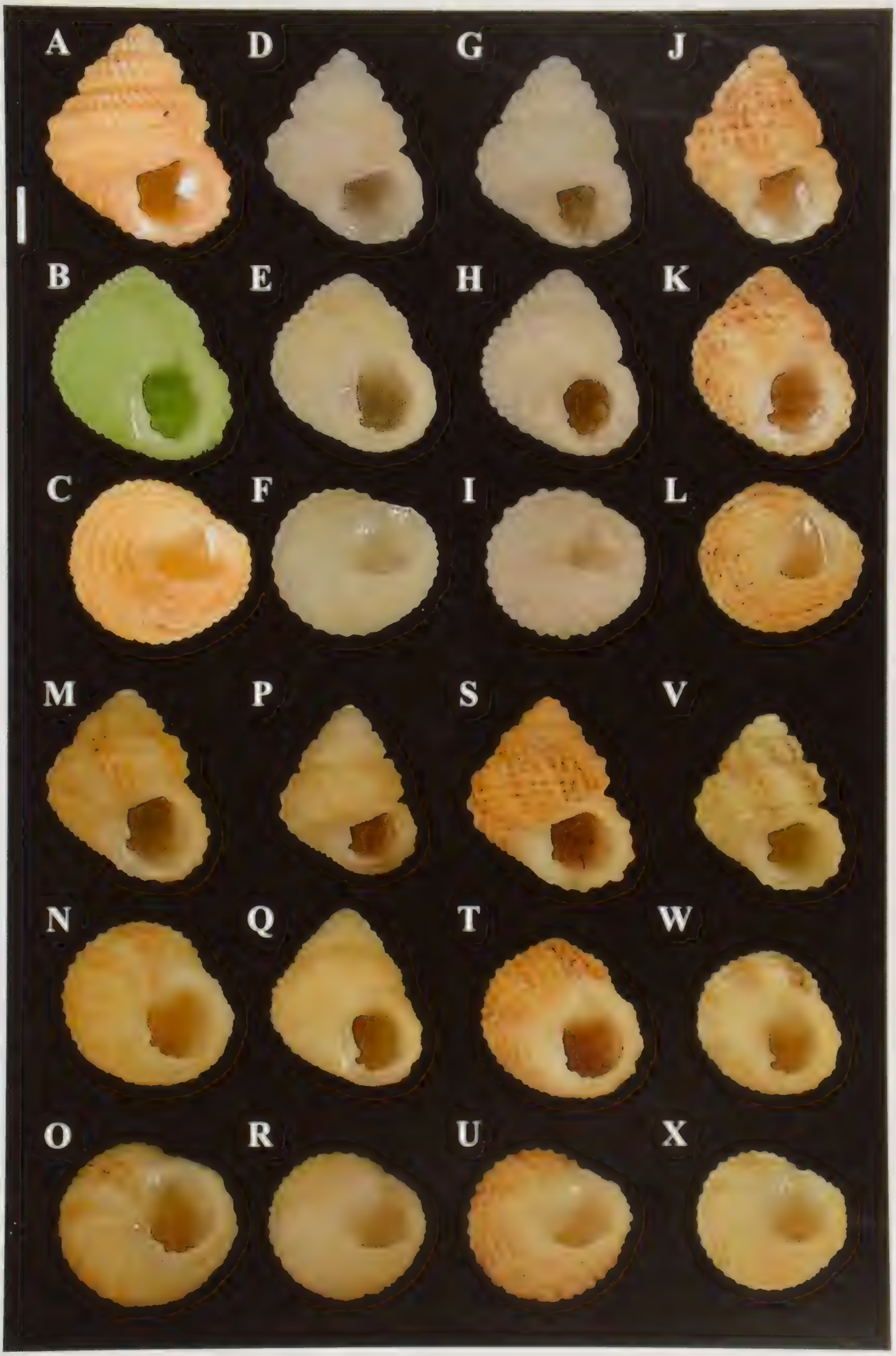
Material examined. French Polynesia, Australes Archipelago. BENTHAUS: stn DW1868, 28°59'S, 140°14'W, 173-250 m, 1 dd. – Stn DW1876, 28°59'S, 140°15'W, 150-160 m, 2 dd. – Stn DW1884, 27°54'S, 143°33'W, 570-620 m, 1 dd. – Stn DW1998, 22°25'S, 151°22'W, 250-302 m, 1 dd.

Distribution. French Polynesia, Société Islands, 460-700 m, lv at 455-650 m (*fide* original description); Australes Archipelago, 160-570 m (dd).

Remarks. The main characteristics of this species are:
- height up to 4.8 mm, width up to 4.3 mm;
- elevated, spire rather high, conical;
- protoconch of about 200 µm;
- teleoconch up to 5.1 convex whorls with 4 granular spiral cords on penultimate whorl; subangular periphery; on first whorl, thin prosocline threads, distance between threads interspace between similar in size to threads; at end of whorl, 4 spiral cords Pi (i=1 to 4) appearing almost simultaneously, P1 smaller; on last whorl, all cords similar in size, S4 peripheral, slightly smaller than other cords; distance between cords smaller than cords;

Figure 9 (scale bar: 1 mm).

A-U. ***Herpetopoma verruca*** (Gould, 1861). **A-C.** Indonesia, Tanimbar Islands, KARUBAR, stn DW49, 210-206 m, 4.1 x 3.1 mm. **D-F.** Solomon Islands, SALOMON 2, stn DW2234, 182-277 m, 3.2 x 2.4 mm. **G-I.** Wallis Island, MUSORSTOM 7, stn DW601, 350 m, 3.0 x 2.8 mm. **J-L.** New Caledonia, Koumac, MONTROUZIER, stn 1323, 82-120 m, 3.0 x 2.2. **M-O.** New Caledonia, LAGON, stn 830, 105-110 m, 3.0 x 2.3 mm. **P-R.** Fiji, BORDAU 1, stn DW1469, 314- 377 m, 2.4 x 2.2 mm. **S-U.** Tonga Islands, BORDAU 2, stn DW1523, 300-302 m, 3.2 x 2.5 mm.
V-X. ***Herpetopoma ludiviniae*** (Poppe, Tagaro & Dekker, 2006), PANGLAO 2004, stn P1, 90-200 m, 2.8 x 2.2 mm.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♦ strong labral folds all around the outer lip of the aperture;
♦ columella with one small basal tooth;
♦ base convex with 5 subgranular to granular, similar in size spiral cords; distance between cords smaller than cords;
♦ closed or very narrow umbilicus (reduced to a small chink);
♦ white to yellowish white.

Herpetopoma vitilevuense n. sp.
Figs 10A–F, Tables 7, 9

Type material. Holotype (2.7 x 1.9 mm) MNHN (IM-2000-32788). Paratypes: 6 MNHN (IM-2000-32789), 1 paratype CV.

Type locality. Fiji, southeast of Viti Levu, MUSORSTOM 10, stn CP1376, 18°19'S, 178°09'E, 497-504 m.

Material examined. Fiji. MUSORSTOM 10: stn CP1366, 18°12'S, 178°33'E, 149-168 m, 1 dd. – Stn CP1376, 18°19'S, 178°09'E, 497-504 m, 50 lv (with holotype and paratypes). – Stn DW1383, 18°18.4'S, 178°02.6'E, 230-251 m, 60 dd. – Stn DW1390, 18°18.6'S, 178°05.1'E, 234-361 m, 16 lv. – Stn DW1384, 18°19'S, 178°06'E, 260-305 m, 5 dd. – SUVA 2: stn BS18, 18°11'S, 178°28'E, 83 m, 1 dd. – BORDAU 1: stn DW1469, 19°40'S, 178°10'W, 314-377 m, 1 dd
Solomon Islands. SALOMON 1: stn DW1820, 9°52'S, 160°51'E, 256-329 m, 1 dd. – Stn DW1825, 9°50'S, 160°58'E, 340-391 m, 1 dd.

Distribution. Fiji, 83-497 m, lv at 361-497 m; Solomon Islands, 329-340 m (dd).

Diagnosis. A small yellowish white *Herpetopoma* species with a moderately elevated, cyrtoconoidal spire and a rounded periphery, 3 granular spiral cords on the penultimate whorls with separate beads, a week keel made by the third abapical cord, a small, obtuse columellar basal tooth, strong fold-shape denticles inside the aperture and a convex base with 4 spiral cords and without umbilicus.

Description. *Shell* of small size for the genus (height up to 3.1 mm, width up to 2.4 mm), higher than wide, rather thick, slightly cyrtoconoidal, with a rounded periphery; spire moderately elevated, height 1.1x to 1.6x width, 2.3x to 3.4x aperture height; anomphalous.
Protoconch about 200-250 µm, of 1 whorl, with a thin terminal varix.
Teleoconch up to 4.2 weakly convex whorls, bearing 3 spiral granular cords similar in size, with an additional smaller peripheral cord on last whorl; beads from cords at intersections with strong axial prosocline ribs, rather strong, clearly separate. Suture visible, not canaliculated.
First whorl convex, sculptured by about 25 prosocline smooth, rather thin threads; interspace between threads about 1.5x size of threads. On second whorl, primary cords P1, P2 and P3 appearing at begin of whorl, granular, similar in size; distance between cords similar to size of cords; axial threads connecting beads of cords. On third whorl, cords and threads much stronger (threads becoming ribs), producing a reticulate pattern; distance between cords about 1x to 1.5x size of cords; no Si. On last whorl, beads of cords and ribs strong; distance between cords about 1.5x to 2x size of cords; P3 peripheral, making a week keel; P4 emerging from suture, thinner than the other cords.
Columella straight, vertical, with a small, blunt basal tooth.
Aperture almost circular; outer lip thickened internally and weakly flaring, especially at columella side; 9 to 12 inner long fold-shaped labral denticles that are not the ends of in-running spiral ridges; innermost denticle separated from basal columella tooth by a U-shaped notch.
Base convex, with 4 subgranular, similar in size spiral cords; distance between cords 1.5x to 2x size of cords. No umbilicus .
Colour of teleoconch and protoconch white to yellowish white.
Operculum corneous, multispiral with central nucleus, light brown.

Figure 10 (scale bar: 1 mm).

A-F. ***Herpetopoma vitilevuense*** n. sp., Fiji, southeast of Viti Levu, MUSORSTOM 10, stn CP1376, 497 504 m. **A-C.** Holotype MNHN (IM-2000-32788), 3.1 x2.1 mm. **D-F.** Paratype MNHN (IM-2000-32789), 2.7 x 1.9 mm. **G-L.** ***Herpetopoma naokoae*** Poppe, Tagaro & Dekker, 2006, Philippines. PANGLAO 2004. **G-I.** Stn T13, 90-100 m, 3.4 x 2.5 mm. **J-L.** Stn T31, 100-140 m, 3.3 x 2.3 mm.
M-R. ***Herpetopoma hivaoaense*** n. sp., Marquesas Island, MUSORSTOM 9, stn 1204, 60-62 m. **M-O.** Holotype MNHN (IM-2000-32790), 4.0 x 2.9 mm. **P-R.** Paratype MNHN (IM-2000-32791), 3.6 x 3.0 mm.
S-X. ***Herpetopoma corrugatum*** (Pease, 1861), French Polynesia, Marquesas Islands, Ua Huka, MARQUISES. **S-U.** Stn 12, intertidal zone, 4.2 x 3.4 mm. **V-X.** Stn 35, 25 m, 3.1 x 2.9 mm.

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	TW	H	W	HA	H/W	H/HA
holotype	4	2.7	1.9	0.9	1.42	3.00
paratype 1	3.7	2.7	1.9	0.8	1.42	3.38
paratype 2	4.2	3.1	1.9	1.1	1.63	2.82
paratype 3	4.1	2.7	2.1	0.9	1.29	3.00
paratype 4	4	2.7	2.4	1	1.13	2.70
paratype 5	4	2.6	1.8	0.8	1.44	3.25
paratype 6	4.1	2.3	1.7	0.9	1.35	2.56
paratype CV	4	2.3	1.6	1	1.44	2.30

Table 9. *Herpetopoma vitilevuense* n. sp.: Shells measurements in mm for types.

Discussion. The new species is rather close to *Herpetopoma ludiviniae* (Poppe, Tagaro & Dekker, 2006) from the Philippines (figs 9V-X) but this species has much thinner spiral cords with smaller and more closely packed beads, lacks the weak keel made by P3 and labral fold-shaped denticles that are the ends of in-running spiral ridges.
H. vitilevuense n. sp. may also be compared to *H. verruca* (Gould, 1861) from north-western Info-Pacific (figs 9A-U) but this slightly smaller species has very prominent spiral cords with more closely packed beads, a spiral cord P1 appearing later than P2 and P3, and spiral cords S1 and S2 present.

Etymology. Named after the type locality.

Herpetopoma naokoae
Poppe, Tagaro & Dekker, 2006
Figs 10G–L, Table 7

Herpetopoma naokoae Poppe, Tagaro & Dekker, 2006: 37-38, pl.10, fig.1,3. Type locality: Mactan Island, Philippines.
Herpetopoma naokoae – Herbert, 2012: 443-444, fig. 35:A-F, 36.

Material examined. Philippines. PANGLAO 2004: stn T2, 09°32'N, 123°48'E, 152 m, 1 dd, 1 dd juv. – Stn T13, 9°41'N, 123°50'E, 90-100 m, 1 dd. – Stn T31, 09°33'N, 123°42'E, 100-140 m, 3 dd. – Stn L44 , 9°31'N, 123°41'E, 85-100 m, 5 dd. – Stn L69-73, 09°31'N, 123°41'E, 90-98 m, 14 dd. – AURORA 2007: stn DW2750, 15°53'N, 121°54'E, 538 m, 6 dd. – Guphil, 150m, 1 dd (MNHN IM-2000-5298).
Solomon Islands. SALOMON 1: stn DW1762, 8°40'S, 160°04'E, 396-411 m, 4 dd, 1 dd.
Wallis Island. MUSORSTOM 7: stn DW604, 13°21'S, 176°08'W, 415-420 m, 19 dd.

Distribution. Philippines (Mactan, Balicasag and Bohol Islands), 100-538 m (dd); Solomon Islands, 396-411 m (dd); Wallis Island, 415-420 m (dd).

Remarks. The main characteristics of this species are:
- height up to 3.5 mm, width up to 3 mm;
- rather elevated spire, slightly cyrtoconoidal; sculpture cancellate;
- protoconch of about 100-150 µm;
- teleoconch of about 4.5 convex whorls with 4 granular spiral cords and subsutural horizontal ramp; rounded periphery; on first whorl, only thin prosocline threads, distance between threads at least 2x larger than threads; on second whorl, P2, P3 and P4 appearing at begin of whorl, granular, P4 the strongest; on third whorl, P1 resolving slowly; S4 peripheral on last whorl;
- columella with one basal, sharp, small tooth;
- moderately convex base with 5 rather thick, granular, spiral cords; distance between cords smaller then cords;
- labral folds all around the outer lip of the aperture;
- no umbilicus;
- yellowish white.

Herpetopoma hivaoaense n. sp.
Figs 10M–R, Tables 7,10

Type material. Holotype (4.0 x 2.9 mm) MNHN (IM-2000-32790). Paratypes: 5 MNHN (IM-2000-32791), 1 paratype CV.

Type locality. French Polynesia, Marquesas Island, Hiva Oa Island, MUSORSTOM 9, stn 1204, 9°53'S, 139°03'W, 60-62 m.

Material examined. French Polynesia, Marquesas Island. MUSORSTOM 9: stn 1204, 9°53'S, 139°03'W, 60-62 m, 50 lv (with holotype and paratypes).

Distribution. Only known from the type locality.

Diagnosis. A small light brownish *Herpetopoma* species with an elevated, conical spire and a subangular periphery, 3 granular spiral cords on the penultimate whorl with separate beads and a stronger

abapical cord with sharp beads, 6 or 7 cords on the last whorl, a small, obtuse columellar basal tooth, strong fold-shape denticles inside the aperture and a weakly convex base with 3 strong, prominent spiral cords and a narrow umbilicus.

Description. *Shell* of small size for the genus (height up to 4.0 mm, width up to 3.0 mm), higher than wide, rather thick, more or less conical, with a subangular periphery; spire elevated, height 1.2x to 1.5x width, 2.7x to 3.6x aperture height; narrow and deep umbilicus.
Protoconch about 100-150 µm, of 1 whorl, flat and somewhat sunken, with a terminal lip hard to distinguish.
Teleoconch up to 4.0 straight to very weakly convex whorls, with 3 granular spiral cords, the abapical one the strongest and 6 granular spiral cords of different size on last whorl; beads from cords at intersections with strong axial prosocline ribs, rather strong, somewhat pointed. Suture hardly visible, not canaliculated.
First whorl convex, sculptured by 20-25 prosocline smooth, poorly marked, rather thin threads; interspace between threads similar to size of threads; P3 appearing after mid whorl, granular, quickly rather strong; P2 appearing near the end of whorl, weaker than P3. On second whorl, P1 appearing at first half of whorl, very weak and weakly granular; beads of P3 slightly pointed; distance between cords similar to size of cords; axial threads connecting beads of cords. On third whorl, cords and threads much stronger, threads becoming ribs, producing a subreticulate pattern; beads clearly separate, beads of P3 sharp; distance between cords similar in size to size of cords. On fourth whorl, Pi more or less similar in size, with P3 slightly stronger; S1 and S2 appearing after half of whorl. On last whorl, P4 emerging from suture, slightly stronger than S1 and S2; S3 possibly appearing at extreme end of whorl.
Columella straight, vertical, with a small, blunt basal tooth.
Aperture roundly elliptical, very slightly transverse; outer lip thickened internally and flaring; about 9 long fold-shaped labral denticles as the ends of in-running spiral ridges; two basal denticles separated from basal columella tooth by a U-shaped notch.
Base weakly convex, with 3 strongly granular, elevated, similar in size spiral cords; axial threads between cords, connecting beads; distance between cords similar in size to cords.
Deep and rather narrow umbilicus, funnel shaped, with angular rim crenulated by axial threads.
Colour of teleoconch and protoconch light brown or beige.
Operculum corneous, multispiral with central nucleus, light brown, deeply retracted into the aperture.

	TW	H	W	HA	H/W	H/HA
holotype	4.8	4	2.9	1.1	1.38	3.64
paratype 1	4.6	3.6	3	1.2	1.20	3.00
paratype 2	4.6	4	2.9	1.5	1.38	2.67
paratype 3	4.5	3.9	2.8	1.3	1.39	3.00
paratype 4	4.7	3.6	2.6	1.1	1.38	3.27
paratype 5	4.8	3.8	2.5	1.1	1.52	3.45
paratype 6 CV	4.7	4	2.9	1.1	1.38	3.64

Table 10. *Herpetopoma hivaoaense* n. sp.: Shells measurements in mm for types.

Discussion. The new species is rather close to *Herpetopoma poichilum* Vilvens, 2012 from the Society Islands (French Polynesia) (figs 8P-T), but this slightly greater species has a different ontogeny of cords with all the Pi appearing almost simultaneously, lacks the S1, S2 and S3 cords, has 5 spiral cords on the base and a closed (or reduced to a small chink) umbilicus.
H. hivaoaense n. sp. may also be compared to *H. pantantoi* n. sp., from New Caledonia (figs 8J-O), but this slightly greater, strictly conical in shape species has again a different ontogeny of cords with all the Pi appearing almost simultaneously, has 5 spiral cords on the base and no umbilicus.

Etymology. Named after the type locality.

Herpetopoma corrugatum (Pease, 1861)
Figs 10S–X, Table 7

Euchelus corrugatus Pease, 1861: 435. Type locality: Sandwich Island (nowadays Hawaii).
Euchelus fimbriatus – Kay, 1965: figs 12-13.
Euchelus corrugatus – Kay, 1979: 49, fig 14-A.
Herpetopoma corrugatum – Severns, 2011: 44, pl. 6, fig 3.
Herpetopoma corrugatum – Vilvens, 2012: 5-6, figs 22-23.
Herpetopoma corrugatum – Herbert, 2012: 439, figs 69A, B.

Material examined. French Polynesia, Marquesas Islands. MUSORSTOM 9: stn DW1203, 9°53'S,

139°02'W, 60-61 m, 1 lv. – MARQUISES: stn 12, 8°56'S, 139°33'W, intertidal zone, 5 dd. – Stn 15, 8°56'S, 140°06'W, 15-30 m, 1 dd. – Stn 23, 8°56'S, 139°31'W, intertidal zone, 1 dd. – Stn 24bis, 8°54'S, 139°37'W, 20-34 m, 1 dd. – Stn 30, 8°56'S, 139°32'W, 20-30 m, 2 dd. – Stn 35, 8°56'S, 139°31'W, 25 m, 11 dd. – Stn 36, 8°56'S, 139°32'W, intertidal zone, 1 dd. – POLYNESIE FRANCAISE: stn 02, 8°56'S, 140°06'W, 10-20 m, 4 dd, 5 dd juv. – Stn 03, 8°56'S, 140°07'W, 10-20 m, 3 dd. – Stn 20, 9°21'S, 140°06'W, 10-15 m, 1dd.

Distribution. Hawaii, Marshall Islands, subtidal (Kay, 1979; Severn, 2011); French Polynesia, Marquesas Islands, 1-60m, lv at 60-61 m.

Remarks. The main characteristics of this species are:

- height about 3.8 mm, width about 3.7 mm (lectotype);
- moderately elevated spire, conical to slightly cyrtoconoidal; sculpture cancellate;
- protoconch smooth;
- teleoconch of about 4 slightly convex whorls with 5 granular spiral cords on penultimate whorl; subangular periphery; P1, P2 and P3 clearly visible at 2nd whorl, P3 the strongest; axial threads between cords, connecting rounded beads of cords; distance between cords similar to cords; on 3rd whorl, S1 resolving with S2 possibly later; P4 peripheral on last whorl, possible S3, thinner;
- columella with a weak basal tooth;
- moderately convex base with 3 rather thick, granular, spiral cords; distance between cords larger than cords; axial threads between cords;
- labral folds all around the outer lip of the aperture;
- narrow deep umbilicus;
- whitish with dark spots.

Differences with *H. fimbriatum* (Pease, 1861) (type locality: Sandwich Island, nowadays Hawaii) seem not obvious. Kay (1965) mentions the lack of umbilicus and, apparently ("four cords on last whorl" ?) the presence of the single S1. Severns (2011) figures the NHMUK holotype, unfortunately without a basal view; only S1 is visible as secondary cord. Herbert (2012) also figures the holotype and mentions a more angular periphery and three spiral cords on the penultimate whorl (instead of how many for *H. corrugatum* ?). Moreover, Kay (1979) points out that there are no recent records of this species in Hawaii area. Further studies are clearly needed to establish the specific features of this poorly known species. All the samples from French Polynesia here examined have an umbilicus and are considered as *H. corrugatum*, although some of them have an earlier S1 and a more elevated spire (figs 10V-X).

Herpetopoma rubrum (A.Adams, 1853)
Figs 11A–F, Table 7

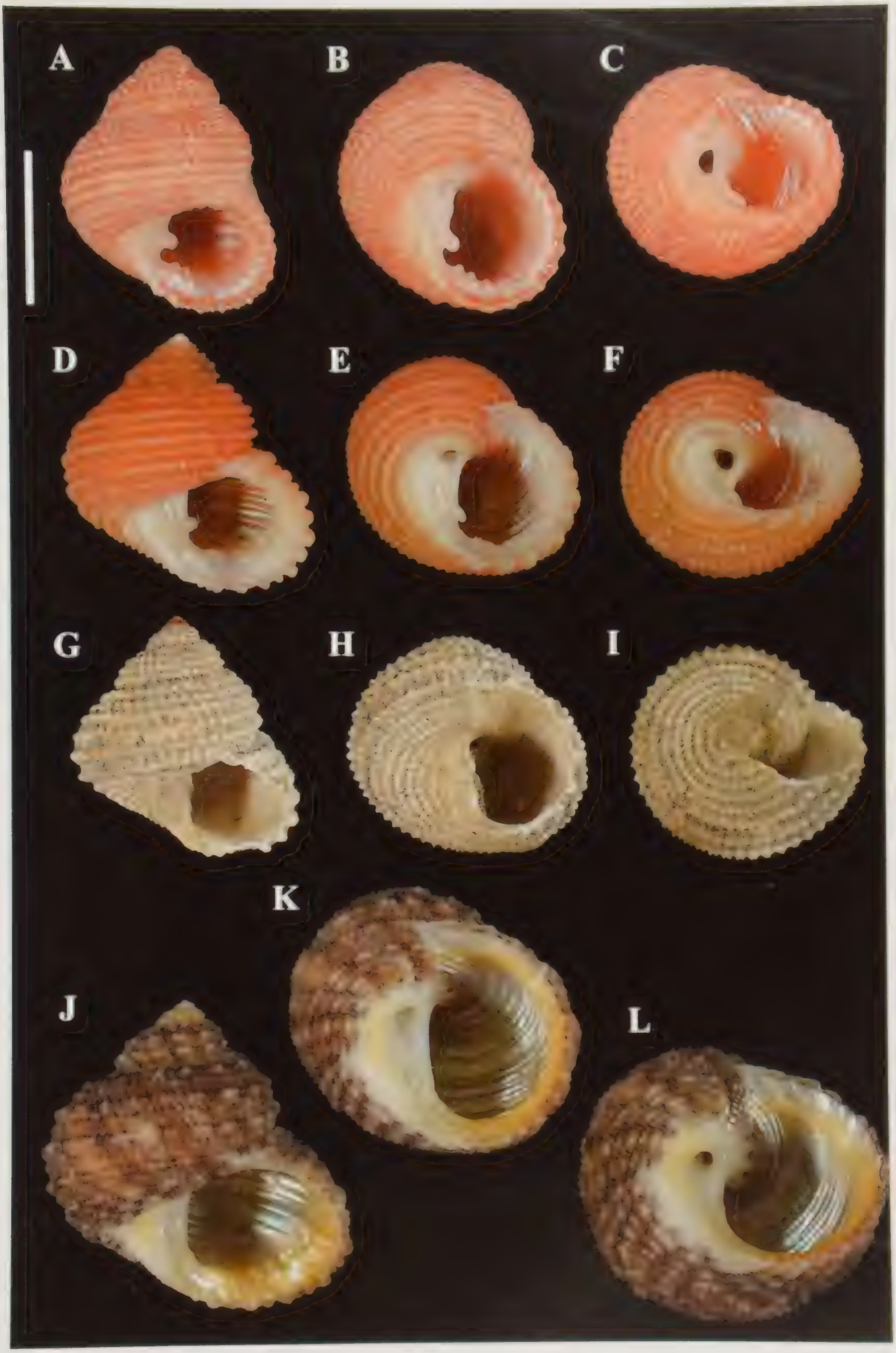
Monodonta rubra A. Adams, 1853: 176. Type locality: not specified.
Euchelus hachijoensis Pilsbry, 1904: 406, pl. 27, figs. 39-40. Syn.
Euchelus ruber brunneus Pilsbry, 1901: 53. Syn.
Herpetopoma rubra - Wilson, 1993: 68.
Euchelus rubrus – Jansen, 1996: 11, fig. 27.
Euchelus rubra – Kosuge & Chino, 1998: 77, pl.25, fig. 1.
Euchelus rubra – Higo, Callomon & Goto, 1999: 52 (giving China for type locality).
Euchelus rubra – Sasaki, 2000: 57, pl. 28, fig. 15.
Herpetopoma rubrum – Poppe, Tagaro & Dekker, 2006: 39, pl.11, figs.1-3.

Material examined. Philippines. PANGLAO 2004: stn L51-60 (collected in 10/2003), 9°38'N, 123°48'E, 62 m, 1 dd, 1 dd juv. – Stn L69-73 (collected in 10/2003), 9°31'N, 123°41'E, 90-98 m, 1 dd, 1 dd juv. – Stn B13, 9°37'N, 123°53'E, 3-5 m, 1 dd. – Stn L43, 9°30'N, 123°55'E, 60 m, 1 dd juv. – Stn L46, 9°31'N, 123°41'E, 90-110 m, 1 dd.

Distribution. Philippines, 5-92 m; Australia (from Western Australia to Queensland), subtidal; Japan, Korea, China and Indonesia, subtidal.

Figure 11 (scale bar: 5 mm).

A-F. ***Herpetopoma rubrum*** (A.Adams, 1853). **A-C.** Philippines, PANGLAO 2004, stn L46 , 90-110 m, 8.2 x 8.0 mm. **D-F.** Western Australia, Broome, intertidal zone, 8.2 x 8.0 mm, coll. C.Vilvens.
G-I. ***Euchelus polysarkon*** n. sp.,Taiwan, off Tashi, TAIWAN 2001, stn CP109, 24°48'S, 122°84'E, 246-256 m, holotype MNHN (IM-2000-32792), 7.2 x 6.5 mm.
J-L. ***Euchelus asper*** (Gmelin, 1791), Singapore, Changi Point, intertidal zone, 11.4 x 11.2 mm, coll. C.Vilvens.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Remarks. The main characteristics of this species are:

- height up to 8.5 mm, width up to 8 mm;
- cyrtoconoidal in shape, rather elevated spire;
- teleoconch of about 4.5 convex whorls with 8 granular, beaded spiral cords on the penultimate whorl, up to 10 on the last whorl; beads of cords rounded on first whorls, axially elongated on the last whorls; first whorl with numerous prosocline, thin axial threads; P2 and P3 after mid first whorl, P1 at begin of 2nd whorl; S1 at end of 2nd whorl; S2 then S3 at begin of 3rd whorl, P2 and P3 temporarily stronger; T2 between S1 and P2, next T1 between P1 and S1; P4 and S4 visible on last whorl; distance between cords similar in size to the width of cords;
- aperture subcircular, with about a dozen ridge-like denticles inside;
- columella with one strong, prominent basal columellar tooth and, on the Philippine samples only, a second weaker upper tooth; deep U-shaped notch between the basal tooth and the first labral denticle.
- base convex, with 4, sometimes 5, strong granular spiral cords; distance between cords similar in size to the width of cords;
- rather wide umbilicus, with perspective to apex and possibly (on the Philippine samples only) an inductural callus only bordering the umbilical area;
- light to dark red.

This species should be highly variable regarding the columellar teeth system. Neither the second adapical columellar tooth nor the partial covering of the umbilicus by the inductural callus are indeed mentioned in the original description. Australian authors (e.g. Wilson, 1993; Jansen, 1996) and Japanese authors (e.g. Kosuge & Chino, 1998; Sasaki, 2000) always figure more stocky samples with a single columellar basal tooth. But nonetheless, the cords ontogeny of the Pi-Si-Ti cords are the same on the few Australian and Philippine samples I have examined.

Comparison of the Philippine *H. rubrum* samples with *H. gemmatum* (Gould, 1845) specimens is also clearly needed: the general shape and the colour are very different (whitish with reddish spots) but the cords ontogeny is only slightly different, with S1 occurring much later (and with S2) on *H. gemmatum* samples.

Genus ***Euchelus*** Philippi, 1847.

Type species: *Trochus quadricarinatus* [Chem.] Holten, 1802 [=*Trochus asper* Gmelin, 1791], by subsequent designation (Herrmannsen, 1847) – Recent, Indo-Pacific.

Remarks. The main features for *Euchelus* are a rather big size (H up to 23 mm), numerous finely beaded spiral cords, a poorly cancellate and never foveolate sculpture. The main feature is a single weak columella tooth, lacking the peg-like tooth coupled with an U-shaped notch on the basal lip, distinctive for *Herpetopoma*.

Euchelus polysarkon n. sp.
Figs 11G–I

Type material. Holotype (7.2 x 6.5 mm) MNHN (IM-2000-32792).

Type locality. Taiwan, off Tashi, TAIWAN 2001, stn CP109, 24°48'S, 122°?84'E, 246-256 m.

Material examined. Taiwan. TAIWAN 2001: stn CP109, 24°48'S, 122°84'E, 246-256 m, 1 dd (holotype).

Distribution. Only known from the type locality.

Diagnosis. A small whitish *Euchelus* species with a moderately elevated, roundly conical spire and a rounded periphery, 4 granular spiral cords on the penultimate whorl with separate beads and, 6 cords on the last whorl, a straight vertical columella without tooth, a half-moon shaped aperture and a weakly convex base with 6 spiral cords and without umbilicus.

Description. *Shell* of small size for the genus (7.2 mm, 6.5 mm), higher than wide, roundly conical, with a rounded periphery; spire moderately elevated, height 1.1x width, 2.2x aperture height; anomphalous.

Protoconch about 200 µm, of 1 whorl, flattened, without visible terminal lip.

Teleoconch of 4.8 convex whorls, with 4 granular, similar in size spiral cords on penultimate whorl and 6 cords on last whorl; distance between cords greater than cords; beads from cords rounded, isolated, at intersections with strong axial prosocline ribs. Suture visible, not canaliculated.

First whorl convex, sculptured by about 20 smooth, rather large, poorly marked, prosocline threads; interspace between threads similar to size of threads. On second whorl, P2, P3 and P4 appearing, P1 half a whorl later, all with rounded, isolated, granular beads; P1 weaker than the other cords; distance between cords slightly greater than size of cords; axial threads connecting beads of cords. On third whorl, cords and threads much stronger, threads becoming ribs; S1 resolving neat end of whorl. On fourth whorl, P1 as strong as the other Pi; beads of cords slightly axially elongated. On last whorl, S4 emerging from suture, weaker than all the other cords.

Columella straight, vertical, with two weak bulges.

Aperture half-moon shaped; outer lip rather thick, without but with short notches corresponding to the external spiral cords.

Base moderately convex, with 6 granular, similar in size spiral cords; axial threads between cords, connecting beads; distance between cords similar in size to cords.

No umbilicus.

Colour of teleoconch and protoconch nacreous white, except the reddish brown first teleoconch whorl.

Discussion. Among the known Chinese Chilodontidae (Dong, 2002; Qi. 2004) or even Southeast Asia (e.g. Dharma, 1988; Swennen et al., 2001; Thach, 2007), no *Euchelus* or *Herpetopoma* species seem close to the new species, except thesimilar in shape *Euchelus scaber* (Linnaeus, 1758) that is much bigger with alternating strong and weaker spiral cords and has an umbilicus.
On the same way, the new species can be compared to *E. asper* (Gmelin, 1791) (syn. *E quadricarinatus* (Holten, 1802)) from western Indo-Pacific (figs 11J-L) that is much bigger with much stronger, more widely spaced spiral cords and has also an umbilicus.

Etymology. Stout, plump (Greek: πολυσαρχοζ, ον) – with reference to the very large and very convex last whorl of the shell.

Euchelus atratus (Gmelin, 1791)
Figs 12A–O

Turbo atratus Gmelin, 1791: 3601, No 53. Type locality: Nicobar Islands.
Trochus canaliculatus Lamarck, 1818. Syn.
Euchelus atratus – Dharma, 1988: 32, pl.2, fig.18.
Euchelus atratus – Kaicher, 1990: card # 5062.
Euchelus atratus – Jansen, 1996: 11, fig.26.
Herpetopoma atrata – Wilson, 1993: 68, pl.10, fig.3;
Euchelus rubra – Higo, Callomon & Goto, 1999: 52.
Herpetopoma atratum – Poppe, Tagaro & Dekker, 2006: 34, pl.9, fig.2,4.
Euchelus atratus – Herbert, 2012: 426-427.

Material examined. Philippines. PANGLAO 2004: stn M3, 09°33'N, 123°45'E, 0-2.5 m, 1 lv. – Stn M7, 09°36'N, 123°45'E, 0-3 m, 1 lv sub. – Stn B18, 09°39'N, 123°50'E, 3-5 m, 5 lv, 12 lv sub, 15 dd juv. – Stn S22, 09°29'N, 123°56'E, 15-20 m, 4 dd juv. – Stn B31, 09°39'N, 123°50'E, 1-2 m, 1 dd sub, 15 lv juv. – Stn S38, 09°38'N, 123°51'E, 3-4 m, 3 dd. – PANGLAO 2005: stn CP2380, 8°41'N, 123°18'E, 163-271 m, 1 dd, 1 dd sub.
Vanuatu. SANTO 2006: stn LM15, 15°37'S, 167°11'E, intertidal zone, 3 lv sub, 1 lv sub. – Stn VM52, 15°26'S, 167°13'E, intertidal zone, 6 lv, 2 lv sub, 1 lv juv. – Stn VM53, 15°31'S, 167°12'E, intertidal, 9 lv, 2 lv sub.
Indonesia, Moluccas Islands. KARUBAR: Ambon, stn Seith, intertidal zone, 1 dd.

Distribution. Philippines, 1-163 m (using also data of Poppe et al., 2006); Vanuatu, lv in intertidal area; Australia (from Western Australia to Queensland), intertidal and shallow subtidal; Japan, Korea, China and Indonesia.

Remarks. The main features of this species are:
- up to 23 x 21 mm
- spire rather elevated, conical to slightly cyrtoconoidal;
- teleoconch up to 5.5 moderately to very convex teleoconch whorls; rounded periphery; P3 and P2 at half of first whorl, P1 a bit later; S2 and S3 at the beginning of second whorl, S1 from half to end of second whorl; Ti at fourth whorl between Pi and Si; on last whorl, P4 peripheral; cords similar in size; beads of cords high, axially elongated from third whorl; distance between cords smaller than cords;
- columella with a weak basal tooth; denticles all along the outer lip;
- base convex with 4-5 spiral cords, similar to teleoconch whorls;
- rather large umbilicus, funnel shaped, with perspective to apex and weak axial lines;
- reddish brown.

On the large specimens (H>20), S1 appears with Pi and is stronger than P1, while T1 appears very early.
Poppe et al. (2006) consider that the large specimens from north-western Australia belong to another species: *Herpetopoma sulciferum* (A.Adams, 1853). The WoRMS's position is apparently only based on these authors. But surprisingly, no Australian marine malacofauna book that I know mentions this species. Moreover, the Australian Faunal Directory (Beechey & Ponder, 2014) considers it under the global name *Euchelus atratus* (Gmelin, 1791). A further study is clearly needed and so, waiting for such a survey, I adopt here a "conservative" position, keeping *E. atratus* as the only used name around the Indo-Pacific area.

Genus: ***Ascetostoma*** Herbert, 2012
Type species: *Euchelus providentiae* Melvill, 1909 (by original designation) – Recent, Seychelles Is.

Remarks. The basic features for *Ascetostoma* are a moderate to rather big size (H up to 16 mm), a reddish colour, rounded whorls with numerous, finely beaded spiral cords. But the main features of *Ascetostoma* are above all (Herbert, 2012):
- a columella with a strong, squarish, basal tooth and a smaller, more rounded, median tooth, with pronounced U-shaped notch between basal tooth and first outer lip denticle;
- a rather large umbilicus deep down a cavity, apically closed by a callus, with a margin bearing several small denticles and especially one larger in parietal region;
- a parietal glossy, translucent callus deposit bordering the aperture (such a callus is much more extensive in *Clypeostoma*) and bearing short oblique ridges.

Ascetostoma ringens (Schepman, 1908)
Figs 13A–O

Euchelus ringens Schepman, 1908: 71-72, pl. VI, fig. 6. Type locality: Sulu Archipelago, Philippines, 350 m.

Herpetopoma ringens – Poppe, Tagaro & Dekker, 2006: 38-39, pl.8, figs.1-2.
Ascetostoma ringens – Herbert, 2012: figs. 68:A-B.

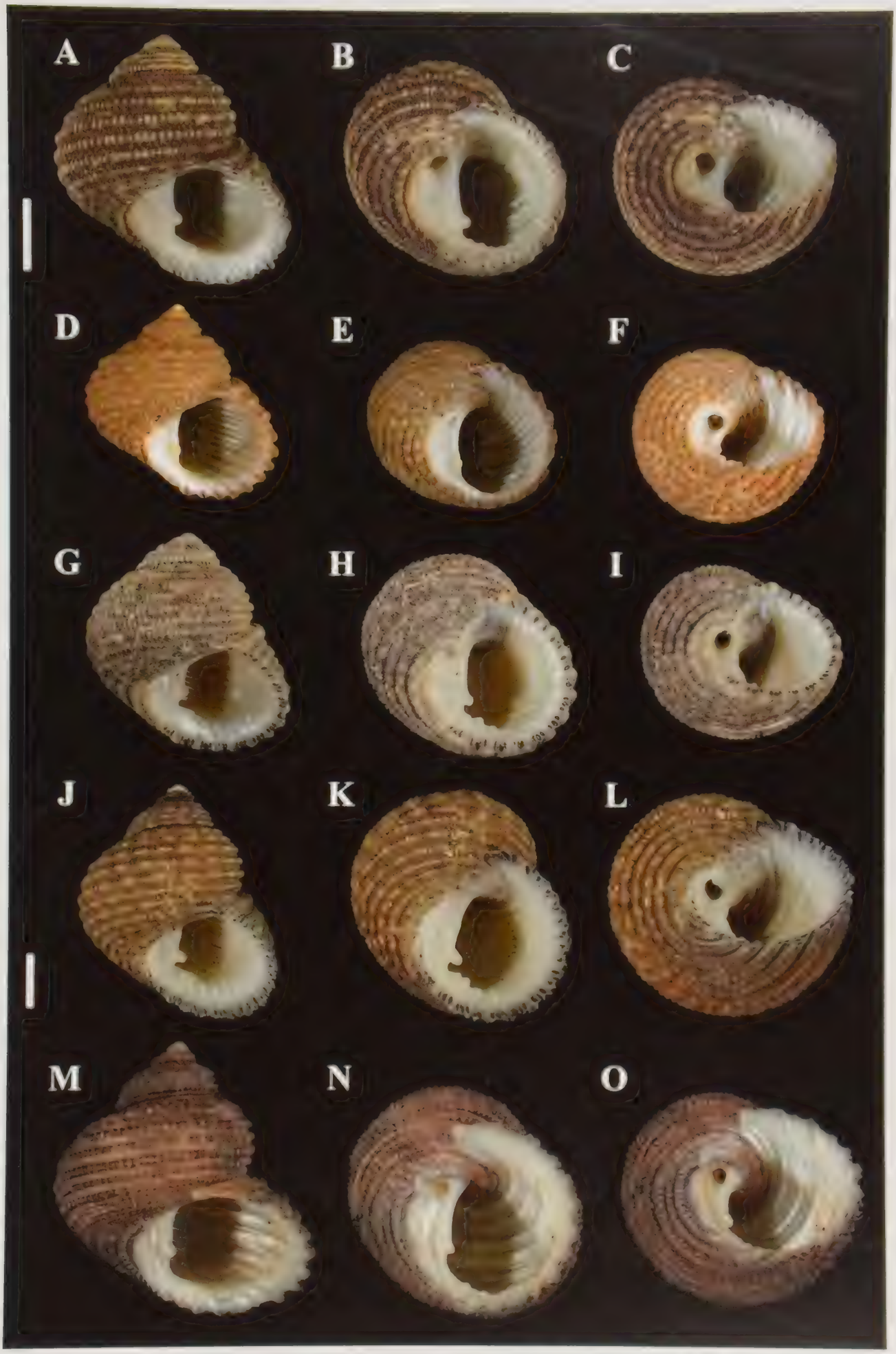
Material examined. New Caledonia. LAGON: stn DW267, 22°22'S, 166°15'E, 70 m, 1 dd. – Stn DW320, 22°32'S, 166°54'E, 70 m, 2 dd. – Stn DW602, 22°16'S, 167°03'E, 43-48 m, 1 dd. – Stn DW677, 21°37'S, 166°22'E, 32 m, 1 dd sub. – Stn DW830, 20°49'S, 165°19'E, 105-110 m, 10 dd, 15 dd juv. – Stn DW1139, 19°24'S, 163°47'E, 39 m, 1 dd sub. – MUSORSTOM 4, stn DW162, 18°35'S, 163°10'E, 525 m, 2 dd. – BATHUS 1: stn DW692, 20°35'S, 164°59'E, 140-150 m, 3 dd. – MONTROUZIER: stn 1260, 20°44'S, 165°14'E, 49–59 m,1 dd. – Stn 1269, 15–20 m, 20°35'S, 165°08'E, 49–59 m, 1 dd. – Stn 1315, 20°41'S, 164°15'E, 66-87 m, 3 dd. – Stn 1323, 20°41'S, 164°15'E, 82-120 m, 3 dd, 2 dd sub, 2 dd juv. – Stn 1331, 20°40'S, 164°11'E, 55-57 m, 1 dd sub, 4 dd juv. – BATHUS 4: stn DW882, 22°02'S, 165°56'E, 250-350 m, 1 dd. – NORFOLK 1: stn DW1727, 23°17'S, 168°14' E, 190-212 m, 1 dd sub. – EBISCO: stn DW2555, 21°04'S, 158°35'E, 500-614 m, 1 dd. – Baie St Vincent, ilot Tenia, 42 m, coll Menou, 1 dd sub.
Loyalty Islands. MUSORSTOM 6: stn DW442, 20°54'S, 167°17'E, 200 m, 1 dd, 1 dd sub. – LIFOU 2000: stn 1461, 20°54'S, 167°02'E, 100-120 m, 1 dd. – Stn DW1648, 20°54'S 167°03'E, 150-200 m, 2 dd.
Fiji. MUSORSTOM 10: stn CP1363, 18°12'S 178°33'E, 144-150 m, 1 dd sub. – SUVA 4: stn DW08, 18°22'S, 178°02'E, 28-30 m, 5 dd.
French Polynesia, Australes Archipelago. RAPA 2002: stn 5, 27°06'S, 144°19'W, 8 m, 1 dd, 1 dd sub. – Stn 8, 27°37'S, 144°18'W, 52-57 m, 1 dd sub. – Stn 9, 27°37'S, 144°22'W, 3-24 m, 1 dd, 1 dd juv. – Stn 10, 27°35'S, 144°23'W, 16-18 m, 1 dd. – Stn 14, 27°36'S, 144°14'W, 2 m, 2 lv. – Stn 34, 27°39'S, 144°19'W, 2-8 m, 2 dd. – Stn 42, 27°37'S, 144°18'W, 2 m, 1 dd. – Stn 44, 27°36'S, 144°18'W, 30 m, 2 dd sub, 10 dd juv. – Stn 46, 27°37'S, 144°20'W, 10-42 m, 1 dd. – Stn 47, 27°37'S, 144°19'W, 33 m, 1 dd, 4 dd juv. – Stn 61, 27°37'S, 144°19'W, 10-15 m, 1 dd, 10 dd juv. – Stn 70, 27°37'S, 144°20'W, 15-20 m, 1 dd. – BENTHAUS: stn DW1927, 24°39'S, 146°02'W, 95-105 m, 1 dd sub. – Stn DW1939, 23°50'S, 147°42'W, 100 m, 2 dd sub. – Stn DW1968, 23°23'S, 150°44'W, 100-120 m, 2 dd, 2 dd juv. – Stn DW1985, 23°26'S, 150°44'W, 100-107 m, 1 dd, 1 dd sub. – Stn DW1997-2001, 22°26/27'S, 150°20'W, 200-1000 m, 1 dd. – Stn DW2013, 22°39'S, 151°50'W, 80-93 m, 1 dd sub. – Stn DW2018, 22°37'S, 151°49'W, 770-771 m, 1 dd.
Vanuatu. SANTO 2006: stn DS99, 15°33'S, 167°17'E, 100-105 m, 1 dd, 1 dd sub. – Stn DS103, 15°31'S, 167°16'E, 70-80 m, 1 dd.
Solomon Islands. SALOMON 1: stn DW1770, 8°20'S, 160°39'E, 453-542 m, 1 dd sub. – Stn DW1823, 9°50'S, 160°53'E, 82-83 m, 1 dd. – SALOMON 2: stn DW2198, 7°43'S, 158°30'E, 273-300 m, 1 dd. – Stn DW2237, 6°53'S, 156°22'E, 400 m, 4 dd, 9 dd sub, 2 dd juv.
Indonesia. KARUBAR: stn DW22, 05°22'S, 133°01'E, 82 m, 1 dd.
Philippines. PANGLAO 2004: stn B7, 09°36'N, 123°52'E, 4-30 m, 8 dd, 10 dd sub, 10 dd juv. – Stn B40, 09°35'N, 123°50'E, 22 m, 1 dd, 2 dd sub, 6 dd juv. – Stn L49 , 9°37'N, 123°45'E, 90 m, 1 dd, 1 dd juv. – Stn T4, 09°33'N, 123°49'E, 82 m, 1 dd. – Stn T38, 09°32'N, 123°42'E, 80-140 m, 2 dd, 4 dd juv.

Distribution. New Caledonia, 32-525 m (dd); Loyalty Islands, 120-200 m (dd); Fiji, 30-144 m (dd); French Polynesia, Australes Archipelago, 2 -770 m, lv at 2 m; Vanuatu, 80-100 m (dd); Solomon Islands, 83-453 m (dd); Indonesia, 82 m (dd); Philippines, 22-90 m (dd).

Remarks. The main characteristics of this species are:
- height up to 8.5 mm, width up to 7.5 mm;
- rather elevated spire, cyrtoconoidal in shape;
- protoconch of 1 whorl, about 200 µm;
- teleoconch of up to 5 very convex whorls with up to 5 or 6 granular, beaded spiral cords on penultimate whorl and about 10 cords on last whorl; rounded periphery; first whorl with rather strong axial threads, P2 and P3 resolving at end of whorl, P1 a bit later; S1 and S2 at beginning of third whorl, S3 at end of third whorl or at begin of fourth whorl; P2 and P3 stronger than other cords; on fourth whorl, T1, T2 and possibly T3 appearing respectively between P1 and S1, S1 and P2, P2 and S2; P4 peripheral on last whorl, cords more or less similar in size; distance between cords similar in size to the width of cords; possibly a very thin S4 under P4;
- on last whorls, sulcus around the suture, made by subsutural cord and suprasutural cord of preceding whorl;
- aperture more or less circular, with 12-14 ridge-like denticles inside;

Figure 12 (scale bars: 5 mm).

A-O. ***Euchelus atratus*** (Gmelin, 1791). **A-C.** Vanuatu, SANTO 2006, stn VM53, intertidal zone, 14.3 x 13.2 mm. **D-F.** Indonesia, KARUBAR: stn Seith, intertidal zone, 9.9 x 9.8 mm, coll. C.Vilvens. **G-I.** Philippines, PANGLAO 2004, stn S38, 3-4 m, 12.2 x 11.5 mm. **J-L.** Malaysia, intertidal zone, 18.1 x 15.8, coll. C.Vilvens. **M-O.** Western Australia, Port Hedland, 5 m 22.4 x 21.3 mm, coll. C.Vilvens.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♦ columella with a well developed, squarish, basal tooth and a smaller, more rounded, upper one; U-shaped notch between basal tooth and first outer lip denticle.

♦ base convex, with 4 strong granular spiral cords; distance between cords from 1x to 1.5x the width of cords; possibly a thin additional cord between the two outermost cords; parietal region with spreading, glossy, translucent callus deposit, bearing short oblique ridges;

♦ umbilicus closed by a callus, bordered by a strong parietal tooth projecting over umbilical area and additional smaller denticles;

♦ brown or orange to brownish white, possibly with darker brown spots.

Herbert (2012) considers that *Ascetostoma ringens* could be conspecific with *A. providentiae* (Melvill, 1909) from western Indian Ocean, the only obvious differences being that the African species is slightly more elevated and have a wider umbilicus.

On the same way, the samples coming from Australes Archipelago (Rapa Island) show minor differences with the specimens from the other areas: the whorls are less convex, the parietal tooth on the callus is much weaker and thin additional spiral cords are present between the main cords of the base. But this is a bit lightweight to consider that these Polynesian species justify a new (sub)species.

Ascetostoma pteroton n. sp.
Figs 13P–U, Table 11

Type material. Holotype (16.5 x 15.4 mm) MNHN (IM-2000-32793). Paratypes: 2 MNHN (IM-2000-32794), paratype CV.

Type locality. Australes Archipelago, Rapa Island, Mei Point, RAPA 2002, stn 31, 27°38'S, 144°18'W, 6 m.

Material examined. French Polynesia, Australes Archipelago. RAPA 2002: stn 5, 27°06'S, 144°19'W, 8 m, 1 dd, 1 dd sub, 2 dd juv. – Stn 8, 27°37'S, 144°18'W, 52-57 m, 3 dd, 6 dd sub. – Stn 10, 27°35'S, 144°23'W, 16-18 m, 5 lv sub, 3 dd juv. – Stn 11, 27°37'S, 144°18'W, 2 m, 1 dd. – Stn 16, 27°36'S, 144°18'W, 5 m, 1 dd, 1 dd juv. – Stn 17, 27°35'S, 144°23'W, 9 m, 1 dd juv. – Stn 19, 27°38'S, 144°19'W, 3 m, 1 dd juv. – Stn 20, 27°35'S, 144°23'W, 5 m, 1 dd juv. – Stn 22, 27°34'S, 144°22'W, 18-22 m, 1 dd juv. – Stn 28, 27°38'S, 144°21'W, 30 m, 1 dd sub. – Stn 29, 27°34'S, 144°21'W, 2-4 m, 3 dd juv. – Stn 30, 27°38'S, 144°18'W, 16-20 m, 1 dd juv. – Stn 31, 27°38'S, 144°18'W, 6 m, 4 dd (with holotype and paratypes) . – Stn 32, 27°35'S, 144°23'W, 15-20 m, 1 dd, 2 dd juv. – Stn 33, 27°35'S, 144°19'W, 30 m, 1 dd juv. – Stn 34, 27°35'S, 144°19'W, 2-8 m, 1 dd sub. – Stn 34, 27°39'S, 144°19'W, 2-8 m, 2 dd sub, 6 dd juv. – Stn 43, 27°37'S, 144°18'W, 45 m, 5 dd sub, 5 dd juv. – Stn 44, 27°36'S, 144°18'W, 30 m, 2 dd, 15 dd sub, 10 dd juv. – Stn 48, 27°34'S, 144°22'W, 36 m, 9 dd juv. – Stn 56, 27°37'S, 144°18'W, 25-30 m, 1 dd juv. – Stn 62, 27°37'S, 144°21'W, 20 m, 1 dd, 4 dd juv. – Stn 70, 27°37'S, 144°20'W, 15-20 m, 1 dd. – Stn 93, 27°35'S, 144°21'W, intertidal area, 1 dd juv. – BENTHAUS: stn DW1885, 27°52'S, 143°33'W, 700-800 m, 2 dd, 1 dd sub.

Distribution. French Polynesia, Australes Archipelago, 1-700 m, lv at 16-18 m.

Diagnosis. A big pinkish with dark spots *Ascetostoma* species with an elevated, rounded conical spire and a rounded periphery, up to 18 thin granular spiral cords on the whorls, a transversally elongated aperture, a strong columellar basal tooth, strong fold-shape denticles inside the aperture, a convex base with about 15 thin spiral cords, an umbilicus deep down within a cavity in a glossy callus deposit.

Description. *Shell* of great size for the genus (height up to 16.5 mm, width up to 15.4 mm), higher than wide, rather thick, roundly conical; spire elevated, height 1.0x to 1.1x width, 1.7x to 1.9x aperture height; anomphalous.

Protoconch about 200 µm, of 1 whorl, with a thin terminal varix.

Teleoconch up to 6.6 weakly convex whorls, bearing about 8 spiral granular cords on penultimate whorl, about 18 thin cords of various size on the last whorl; distance between cords slightly smaller than width of cords; rounded periphery. Suture visible, canaliculated.

First whorl convex, sculptured by about 20 strong, smooth, prosocline threads; interspace between similar in size to ribs; primary cords P2 and P3 appearing at end of whorl. P1 appearing at begin of second whorl, thinner than the two other cords; all cords granular; distance between cords about 1x to 1.5x width of cords; axial ribs stronger, connecting beads of cords. On third whorl, all cords similar in size; beads of cords rounded. S1, S2 and S3 appearing at begin of fourth whorl; S1 and S1 quickly similar in size to Pi, S3 thinner; beads becoming a bit pointed; sulcus appearing at sutural level, made by subsutural cord and suprasutural cord of preceding whorl. On fifth whorl, 6 Ti appearing between the Pi and Si according to a random order, each Ti between two succeeding existing cords. On last whorl, additional cords appearing between all the existing cords, giving a total amount of spiral cords of about 18.

Aperture almost circular, obliquely elongated; outer lip thickened internally and weakly flaring, with about 30 elongated, ridge-shaped denticles; possibly additional smaller ridges between the main ridges on the upper part of lip.

Columella more or less straight, slightly oblique, with a basal tooth, rather strong on fully mature shells

(more than 5 whorls); innermost denticle separated from basal columella tooth by a U-shaped notch.
Base convex, with about 15 granular spiral cords, similar to cords of the body whorl; on fully mature shells, parietal region with spreading, glossy, translucent callus deposit, bearing strong ridges.
Umbilicus deep down a cavity, apically closed by a callus, bordered by a strong, flat parietal tooth and additional smaller denticles.
Colour of teleoconch nacreous white with brownish orange dashes on the spiral cords; protoconch pinkish white.

	TW	H	W	HA	H/W	H/HA
holotype	6.6	16.5	15.4	8.9	1.07	1.85
paratype 1	6.1	13.8	13.3	8.2	1.04	1.68
paratype 2	6	14.9	13.2	8.3	1.13	1.80
paratype CV	5.5	12.7	11.9	7	1.07	1.81

Table 11. *Ascetostoma pteroton* n. sp.: Shells measurements in mm for types.

Discussion. The specific features of *Ascetostoma pteroton* n. sp. make it difficult to confuse it with other chilodontid species. At most could one compare the new species to the well-known *A. ringens* (Schepman, 1908) from western Indo-Pacific (figs 13A-O), but this smaller species has a very different shape, stronger and less numerous spiral cords on the whorls, a stronger columellar tooth and stronger, less numerous inner apertural ridges.
Subadult samples (5 whorls or less) look rather different of the fully mature shells: the umbilicus is still open, there is no callus extending on the parietal wall and the columellar tooth, when present, is reduced. Their shapes evoke some *Euchelus* species, but the cords ontogeny is strictly the one of the bigger shells.

Etymology. Winged (Ancient Greek: πτερωτοζ, η, ον) – with reference to the elongated, finely striated aperture of the shell.

Genus ***Hybochelus*** Pilsbry, 1890
Type species: *Stomatella cancellata* Krauss, 1848 (by original designation) - Recent, Indo-Pacific.

Remarks. The basic features for *Hybochelus* are a moderate to rather big size (H up to 16 mm, W up to 20 mm), a thin shell, a depressed spire, an expanded last adult whorl (but less than in *Granata*) and an open umbilicus bordered by a strong spiral cord.

Hybochelus cancellatus (Krauss, 1848)
Figs 14A–L

Stomatella cancellata Krauss, 1848: 93, pl. 5, fig. 26.
Trochus (Euchelus) fossulatulus Souverbie in Souverbie & Montrouzier, 1875: 39, pl.4, fig.5. Syn. (Herbert, 1996).
Hybochelus fossulatulus – Poppe, Tagaro & Dekker, 2006: 40, pl.12, figs.7.
Hybochelus cancellatus – Wilson, 1993: 69, pl.10, fig.1;

Material examined. New Caledonia. MONTROUZIER: stn 1303, 20°38'S, 164°16'E, 0-8 m, 1 lv, 1 dd juv. – Stn 1270, 20°45'S, 165°17'E, 10-35 m, 1 dd. – Stn 1308, 24°40'S, 164°15'E, 15-20 m, 1 dd.
Loyalty Islands, Lifou. LIFOU 2000: stn 1421, 20°52'S, 167°09'E, 4 m, 1 dd. – Stn 1422, 20°47'S, 167°07'E, 4 m, 1 dd, 1 dd juv. – Stn 1423, 20°54'S, 167°07'E, 12 m, 1 dd. – Stn 1424, 20°55'S, 167°03'E, 4 m, 1 dd. – Stn 1430, 20°48'S, 167°07'E, 20-25 m, 1 dd. – Stn 1432, 20°54'S, 167°03'E, 12-32 m, 3 lv, 2 dd sub, 1 dd juv. – Stn 1434, 20°53'S, 167°08'E, 5-20 m, 1 dd juv. – Stn 1448, 20°46'S, 167°02'E, 20 m, 1 dd juv. – Stn 1449, 20°46'S, 167°02'E, 17 m, 1 dd, sub 1 dd juv.

Distribution. New Caledonia, 8-15 m (dd); Loyalty Islands, Lifou, 4-20 m (dd), lv at 12-32 m.

Remarks. The main characteristics of this species are:
- height up to 16 mm, width up to 20 mm;
- first whorl with axial threads; P3 almost immediately, P2 almost simultaneously, P1 later;
- S1 at or after beginning of second whorl, as strong and other cords at end of whorl; axial threads as thick as cords, giving a regular reticulate pattern;
- at third whorl, P4 merging from suture; one additional thinner Ti cord appearing between each existing spiral cord, also between suture and P1 and under P4 on the last whorl, giving an amount of 11 spiral cords on the last whorl;
- base with 5 main spiral cords, the most internal one bordering the umbilicus; additional thin spiral cords possibly between the most external main cords; space between internal cords deeply excavated;
- large, deep, funnel shaped umbilicus, with perspective to apex;
- arcuate columella without tooth; no denticles in the aperture.

I follow here Herbert (1996) who considers that *Hybochelus fossulatulus* (Souverbie in Souverbie & Montrouzier, 1875) is a synonym of *Hybochelus*

cancellatus (Krauss, 1848). It can be only noted that, on the New Caledonian species, S1 appears apparently earlier than on Australian *H. cancellatus* samples I have examined.

Genus ***Clypeostoma*** Herbert, 2012
Type species: *Turcica salpinx* Barnard, 1964 (by original designation) – Recent, South-eastern Africa.

Remarks. The main features for *Clypeostoma* are a slightly cyrtoconoidal to almost conical rather elevated spire with flat to weakly convex, a reticulated sculpture, a half-moon shaped aperture with an outer lip flaring beyond an internal thickening and above all :

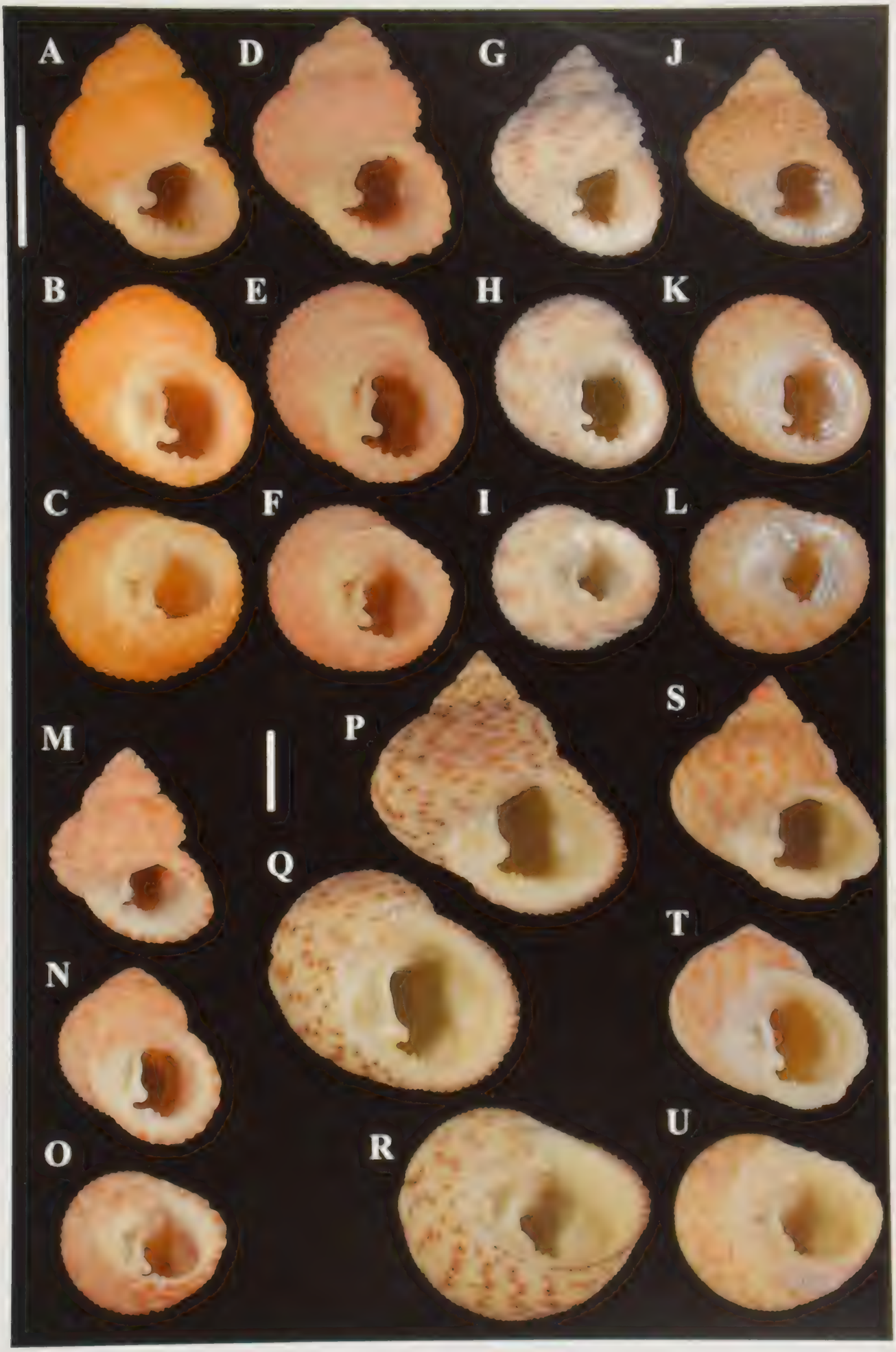
a) two prominent, rounded columellar teeth;
b) a large inductural callus shield covering the umbilical and parietal areas.

Clypeostoma	shell shape	size (mm)	number of spiral cords on penul-timate whorl	which Si/Ti present ?	spiral lirae in aperture ?	number of cords on base	proto-conch exserted dome-shaped (E) or sunken (S)	colour	fron-tal view
nortoni	sl. Cyrtoconoi-dal	12.5x9.5	5	S1, S4	Y (denticles)	5	E	brownish white to brownish grey	
chranos n. sp.	cyrtoconoi-dal	8.0x5.9	4	S4	Y (denticles)	3	?	brownish white	
cancella-tum	conical, spire mod. elevevated	11x8	5	S1	Y	6	S	ivory / reddish brown flames	
cecileae	conical	6.6x4.4	4	-	Y (denticles)	4	E	brown or cream with brown flames	
adelon n. sp.	conical, spire elevated	5.2x3.7	5	S1	Y (denticles)	5	E	yellowish white to light brown	

Table 12. Comparison of conchological features of small central Indo-Pacific *Clypeostoma.* species (sl. = slightly, mod. = moderately).

Figure 13 (scale bars: 5 mm).

A-O. ***Ascetostoma ringens*** (Schepman, 1908). **A-F.** New Caledonia. **A-C.** LAGON, stn 602, 43-48 m, 7.7 x 6.2 mm. **D-F.** MONTROUZIER, stn 1315, 66-87 m, 7.9 x 5.7 mm. **G-L.** French Polynesia, Australes Archipelago, RAPA 2002. **G-I.** stn 47, 33 m, 7.5 x 6.5 mm. **J-L.** stn 14, 2 m, 7.2 x 6.3 mm. **M-O.** Philippines, PANGLAO 2004, stn S8, 28-32 m 8.9 x 7.2 mm.
P-U. ***Ascetostoma pteroton*** n. sp., French Polynesia, Australes Archipelago, Rapa Island, RAPA 2002, stn 31, 6 m. **P-R.** Holotype MNHN (IM-2000-32793), 16.1 x 15.6 mm. **S-U.** Paratype MNHN (IM-2000-32794), 13.8 x 13.3 mm.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Clypeostoma nortoni (McLean, 1984)
Figs 15A–U, Table 12

Agathodonta nortoni McLean, 1984: 122, figs 1–3. Type locality: off Baltazar Is., Philippines.
Agathodonta nortoni – Vilvens, 2001: figs 11–13;
Agathodonta nortoni – Vilvens & Héros, 2003: figs 12, 13;
Agathodonta nortoni – Poppe, Tagaro & Dekker, 2006: 30, pl. 7, figs 3, 4;
Clypeostoma nortoni – Herbert, 2012: 409, figs 8,12H–L.

Material examined. Philippines. PANGLAO 2004: stn P1, 9°36'N, 123°45'E, 90-200 m, 25 lv, 4 lv sub. – Stn P3, 9°31'N, 123°41'E, 100 m, 30 lv, 4 lv sub. – Stn M7, 09°36'N, 123°45'E, 0-3 m, 1 dd. – Stn L77, 9°37'N, 123°46'E, 120 m, 1 dd. – PANGLAO 2005: stn CP2331, 9°39'N, 123°48'E, 255-268 m, 1 lv. – Stn CP2332, 9°39'N, 123°46'E, 396-418 m, 1 lv. – Stn CP2340, 9°30'N, 123°44'E, 291-318 m, 2 lv. – Stn CP2343, 9°27'N, 123°49'E, 273-366 m, 2 lv. – Stn CP2393, 9°30'N, 123°41'E, 356-396 m, 2 lv. – Stn CP2394, 9°29'N, 123°40'E, 470-566 m, 8 lv. – Stn CP2395, 9°36'N, 123°44'E, 382-434 m, 15 lv. – Stn DW2401, 09°31'N, 123°40'E, 397-410 m, 2 dd. – Stn CP2406, 9°41'N, 123°47'E, 334-387 m, 8 lv. – AURORA 2007: stn DW2716, 14°30'N, 121°41'E, 335-356 m, 1 dd, 1 dd sub, 3 dd juv. – Stn DW2670, 14°52'N, 121°49'E, 180-187 m, 20 dd, 10 dd sub, 15 dd juv.
Solomon Islands. SALOMON 1: stn DW1768, 8°21'S, 160°41'E, 194-286 m, 13 dd. – SALOMON 2: stn DW2191, 8°23'S, 159°27'E, 300 m, 1 dd. – SALOMONBOA 3: stn DW2811, 09°42'S, 161°30'E, 228-238 m, 1 dd. –SALOMONBOA 3: stn DW2829, 10°46'S, 162°20'E, 220-292 m, 1 dd.
Taiwan. TAIWAN 2000: stn DW36, 21°55'S, 120°36'E, 305 m, 2 dd.
Indonesia. Kai Islands. KARUBAR: stn DW15, 212-221 m, 05°17'S, 132°41'E, 1 dd. – Stn CP16, 05°17'S, 132°50'E, 315-349 m, 1 lv. – Stn DW44, 07°52'S, 132°48'E, 291-295 m, 1 dd.

Distribution. Philippines, 3-470 m, lv at 100-470 m; Solomon Islands, 238-300 m (dd); Taiwan, 305 m (dd); Indonesia, Kai Islands, 221-315 m (dd), lv at 315-349 m.

Remarks. The main characteristics of this species are:
♦ height up to about 12.5 mm, width up to about 9.5 mm; up to 5.5 whorls;
♦ first whorl with thin axial threads; on second whorl P2, P3 and P4 almost simultaneously, P1 later; S1 at near end of third whorl, quickly as strong and other cords at end of whorl; axial threads connecting beads of cords, thinner than cords, giving a regular reticulate pattern; on fourth whorl, beads pointed, vertically elongated; S4 partially emerging from suture; on last whorl, S4 fully visible, weaker than the other cords; distance between cords from 1.5x to 2x the size of cords;
♦ two strong, rounded columellar teeth; columella weakly excavated with 2 (possibly 3) denticles, the adapical one thicker;
♦ aperture with about 10 elongated denticles on the outer lip and a basal tooth producing a notch with the abapical columellar tooth;
♦ base with 5 strong, granular main spiral cords; distance between cords similar to the size of cords;
♦ callus shield covering the umbilical and parietal areas, with weak superficial ridging on the parietal zone;
♦ brownish white to brownish grey.

In the examined material, one can notice that:
a) some Philippine samples have unexpected reduced columellar teeth, despite their great size (H = 12.5 mm) and 5.5 whorls indicating maturity of the specimens;
b) Taiwanese samples are more conical with almost flat whorls and have additional tertiary cords, with always at least T1 between P2 and P3;
c) on some Indonesian samples, S1 appears later on 4th whorl;
d) one sample from Solomon Islands has small granules on its callus shield.

Clypeostoma chranos n. sp.
Figs 15V–X, Table 12

Type material. Holotype (8.0 x 5.9mm) MNHN (IM-2000-32795).

Type locality. Southeastern coast of Taiwan, TAIWAN 2002, stn DW149, 22°19'N, 121°29'E, 258 m.

Material examined. Taiwan. TAIWAN 2002: stn DW149, 22°19'N, 121°29'E, 258 m, 1 dd (holotype).

Distribution. Only known from the type locality.

Diagnosis. A medium size chilodontid species with a rather elevated, cyrtoconoidal shape and a subangular periphery, with 4 granular cords on the penultimate whorl, a subelliptic, slightly transversally elongated aperture, a convex base with 3 spiral cords and a granular inductural callus covering completely the umbilicus.

Description. *Shell* of medium size for the genus (height 8.0 mm, width 5.9 mm), higher than wide, rather thick, cyrtoconoidal; spire elevated, height 1.4x width, 2.8x aperture height; anomphalous.
Protoconch almost totally missing on the single available specimen.
Teleoconch up to 5.1 convex whorls, bearing 4 strong spiral granular cords; distance between cords similar

in size to cords; subangular periphery. Suture visible, impressed.
First whorl convex, sculptured by about 20 rather strong, slightly prosocline threads;
interspace between them similar in size to threads; P1 and P3 appearing almost immediately, P2 and P4 a bit later, all granular; beads of cords produced by intersection between cords and threads. On second whorl, axial threads stronger, interspace between them about 2x width of threads; P3 and P4 the strongest, P1 the weakest; beads of cords no more close but separated. On third whorl, all cords much stronger; distance between cords ay most similar in size to cords; beads of cords becoming pointed. On fourth whorl, S4 partially emerging from suture; beads of cords axially elongated; axial threads becoming ribs, weaker than cords, connecting no more beads of cords. On last whorl, S4 fully visible, slightly weaker than the other cords.
Aperture subelliptical, axially elongated; outer thick, with 8 strong, horizontally elongated denticles corresponding to the external spiral cords of last whorl and base; inner lip with 3 smaller basal denticles.
Columella straight, slightly opisthocline, weakly excavated, without two teeth, the squared abapical one much stronger;
Base weakly convex to almost flat, with 3 thick granular spiral cords, similar to the cords of the last whorl; very thin, close axial threads between cords.
Umbilicus completely filled by columellar callus; umbilical and parietal areas covered by a large, granular inductural callus shield, some (but not all) granules corresponding to the beads of the underlying basal spiral cords.
Colour of teleoconch brownish white to ochre; base whitish.

Discussion. The new species is rather close to *Clypeostoma nortoni* (McLean, 1984) from central Indo-Pacific (figs 15A-U), but this similar in size species has a more elongated shape, a S1 spiral cord, thinner spiral cords with greater interval between them and usually 5 (rarely 4) spiral cords on the base.

C. chranos n. sp. is also rather similar to *C. reticulatum* Herbert, 2012 from Mozambique, but this proportionally greater size species has a more elongated shape, more numerous and thinner spiral cords on the whorls, similar columellar teeth and 4-6 spiral cords on the base.

Etymology. Helmet (Ancient Greek: κρανος), used in apposition – with reference to the shape of the shell, reminding an Oriental helmet.

Clypeostoma cancellatum (Schepman, 1908)
Figs 16A–X, Table 12

Calliostoma cancellatum Schepman, 1908: 69-70, pl. VI, fig. 5. Type locality: Samau strait, Timor, Indonesia, 390 m.

Perrinia cancellata – Poppe, Tagaro & Dekker, 2006: 40-41, pl.11, figs.4-5, pl.12, fig. 1,3.

Material examined. Philippines. PANGLAO 2004: stn P1, 9°36'N, 123°45'E, 90-200 m, 1 dd juv. – Stn P3, 9°31'N, 123°41'E, 100 m, 2 dd. – Stn T1, 09°32'N, 123°47'E, 83-102 m, 20 dd, 5 dd juv. – Stn T4, 09°33'N, 123°49'E, 82 m, 7 dd, 2 dd sub, 10 dd juv. – Stn T36, 09°29'N, 123°52'E, 95-128 m, 4 dd sub, 6 dd juv. – Stn T38, 09°32'N, 123°42'E, 80-140 m, 2 dd.
Taiwan. TAIWAN 2001: stn CP109, 24°48'N, 122°04'E, 246-256 m, 1 dd. – TAIWAN 2002: stn DW117, 24°59'N, 122°03'E, 126-153 m, 1 dd. –Stn DW149, 22°19'N, 121°29'E, 258 m, 1 dd.
Solomon Islands. SALOMON 1: stn CP1758, 8°49'S, 159°52'E, 180-187 m, 1 dd. – Stn CP1760, 8°47'S, 160°01'E, 172-179 m, 1 dd. – Stn DW1762, 8°40'S, 160°04'E, 396-411 m, 1 dd, 2 dd juv. – Stn CP1848, 10°27'S, 161°58'E, 159-169 m, 2 dd. – SALOMON 2: stn CP2169, 9°01'S, 159°06'E, 100-200 m, 1 dd. – Stn DW2254, 8°28'S, 157°03'E, 150 m, 1 dd. – SALOMONBOA 3: stn CP2804, 09°15'S, 161°21'E, 150-175 m, 1 dd.
New Caledonia. VAUBAN 1978-1979: stn 10, 22°17'S 167°05'E, 80 m, 1 dd. – LAGON: stn 830, 20°49'S, 165°19'E, 105-110 m, 8 dd. –MUSORSTOM 4: stn DW203, 22°36'S, 167°05'E, 105-110 m, 1 dd sub. – CHALCAL 2: stn DW71, 24°42'S 168°10'E, 230 m, 1 dd. – BATHUS 1: stn CP688, 20°33'S, 165°00'E, 270-282 m, 10 dd, 1 dd sub. – Stn CP692, 20°35'S, 164°59'E, 140-150 m, 10 dd, 2 dd, 1 dd sub. – BATHUS 2: stn DW724, 22°48'S, 167°26'E, 344-358 m, 5 dd, 4 dd sub, 5 dd juv. – Stn DW732, 22°50'S, 166°25'E, 236-264 m, 1 dd. – BATHUS 2/MUSORSTOM 8 (mélange accidentel), 4 dd. – MONTROUZIER: stn 1323, 20°41'S, 164°15'E, 82-120 m, 19 lv. – BATHUS 3: stn CP827, 23°22'S, 168°01'E, 381-469 m, 1 dd. –BATHUS 4: stn DW882, 22°02'S, 165°56'E, 250-350 m, 1 dd. – NORFOLK 2: stn DW2040, 23°41'S, 168°01'E, 285 m, 1 dd. – EBISCO: stn DW2549, 21°07'S, 158°38'E, 330-331 m, 1 dd. – Stn DW2622, 20°04'S, 160°21'E, 291-323 m, 1 dd.
Loyalty Islands. LIFOU 2000: stn 1461, 20°54'S, 167°02'E, 100-120 m, 1 dd sub.
Fiji. . MUSORSTOM 10: stn CP1366, 18°12'S, 178°33'E, 149-168 m, 1 dd sub 2 dd juv. – BORDAU 1: stn DW1435, 17°11'S, 178°45'W, 170-183 m, 1 dd. – Stn DW1440, 17°11'S, 178°43'W, 190-308 m, 1 lv.
Wallis and Futuna. MUSORSTOM 7: stn DW512, 14°13'S 178°10'W, 210-245 m, 1 dd sub. – Stn DW604, 13°21'S 176°08'W, 415-420 m, 1 dd sub, 1 dd juv.
Tonga. BORDAU 2: stn DW1601, 20°50'S, 174°57'W, 200-487 m, 1 dd.

Distribution. Philippines, 82-152 m (dd - using also Poppe et al., 2006 data); New Caledonia, 80-381 m (dd), lv at 82-120 m; Loyalty Islands, 100-120 m (dd);

Fiji, 168-190 m, lv at 190-308 m; Wallis and Futuna, 245-415 m (dd); Tonga, 200-487 m (dd).

Remarks. The main features of this species are:
- height up to 11 mm, width up to 8 mm;
- spire rather elevated, conical;
- teleoconch of up to 6.5 almost flat to weakly convex whorls; 5 granular spiral cords on the penultimate whorl, 6 on the last whorl; first whorl with thin prosocline threads, distance between threads much greater threads; the four Pi at second whorl, usually S1 at third whorl; on last whorl, P4 the strongest, peripheral, P1 slightly weaker with strong beads, other cords similar in size except S4 much weaker; distance between cords similar to cords; rather thick, possibly a bit lamellose, prosocline ribs between cords;
- columella with one strong, peg-like, basal tooth and a weaker tooth above it;
- aperture elliptical, with a small translucent inductural callus shield; outer lip rather thick, with about 15 inner folds; possibly one denticle at the base of inner lip making a U-notch under the lowest columellar tooth;
- base rather convex, with 6 granular spiral cords; distance between cords similar to size of cords; axial thin threads between cords;
- no umbilicus;
- ivory with reddish brown flames and markings.

All the studied samples match the Schepman's original description very well, including the parietal callus and the lamellose axial threads on the last whorls. The only difference is that a second adapical columellar tooth is not mentioned.
It seems indeed that there is a rather high variability for this species. First, regarding the columella, the original description and also apparently figures of Poppe et al. (2006) mention only one pointed tooth, for a type being 7 x 5 mm. But some medium and bigger samples show an adapical swelling that can give a second tooth. The small size of the type could maybe explain the lack of mention of this second tooth.
Next, while the Philippine samples have always a S1 spiral cord, all the samples from Taiwan to Solomon Islands and Tonga lack this S1. Some samples from New Caledonia have this S1 or not, sometimes on the same station. Moreover, some specimens have an accretion of axial sculpture elements along the apertural border, reminding a very low varix weakly similar to the one of *Danilia* species.
Finally, some variability is observed regarding the spiral cords on the whorls, which can be thin to a clearly thicker, with axial threads between them lamellose or not.
Also to be noticed is the presence of the inductural callus shield, which doesn't match with the *Perrinia* characterization just like the secondary columellar apical tooth. Herbert (2012) gives an exsert protoconch as a distinctive feature of his new genus *Clypeosotoma* but also noticed that *Perrinia konos* (Barnard, 1964) has an exsert and rather globose protoconch. Considering the columellar U-notch and the parietal callus, is seems likely to put "*Perrinia*" *cancellata* into the *Clypeostoma* genus, although the protoconch of the studied samples is sunken, not exsert.
All the records here reported extend the distribution of this species, splitting it apparently into two separated areas.

Clypeostoma cecileae
(Poppe, Tagaro & Dekker, 2006)
Figs 17A–C, Table 12

Perrinia cecileae Poppe, Tagaro & Dekker, 2006: 42, pl.13, figs.1-3. Type locality: Mactan Island, Philippines.

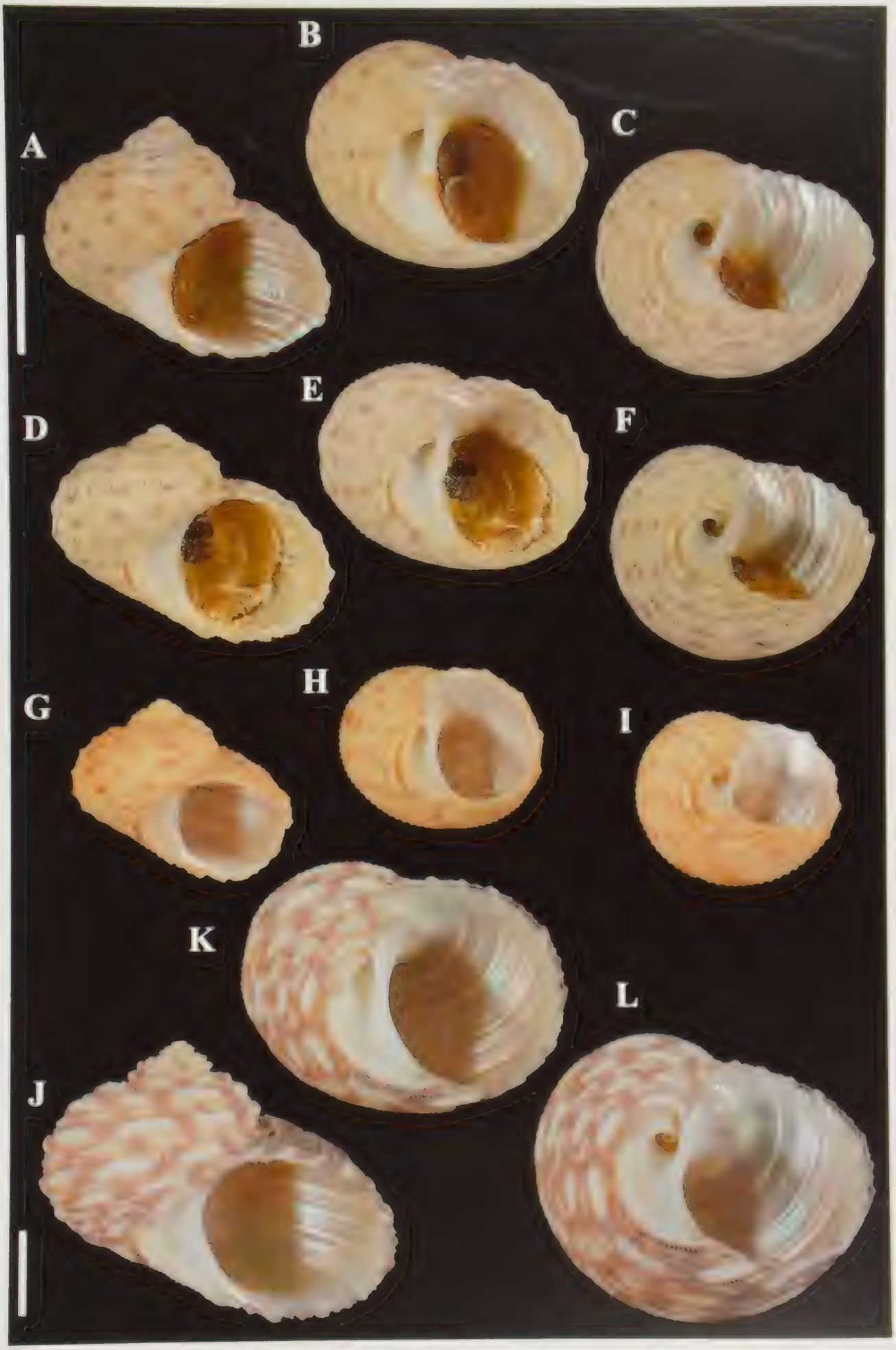
Material examined. PANGLAO 2004: stn L51-60, 9°38'N, 123°48'E, 62 m, 3 dd. – AURORA 2007: stn CP2758, 15°55'N, 121°50'E, 151-173 m, 1 dd.

Distribution. Philippines, 81-100 m (dd - using also Poppe et al., 2006 data);

Remarks. The main characteristics of this species are:
- height up to about 6.6 mm, width up to about 4.4 mm; about 6 whorls;
- protoconch exsert, globose;
- first whorl with thin axial threads; on second whorl, P3, P4 almost simultaneously, P1and P2 later; no Si; axial threads between cords, connecting beads of cords; on next whorls, spiral cords stronger, P4 gradually the strongest with pointed beads on last whorls, making stellate shape from a basal view; distance between cords at least similar to the size of cords;

Figure 14 (scale bars: 5 mm).

A-L. ***Hybochelus cancellatus*** (Krauss, 1848), New Caledonia. **A-F.** Loyalty Islands, Lifou. **A-C.** LIFOU 2000, stn 1432, 12-32 m, 10.8 x 12.4 mm. **D-F.** LIFOU 2000, stn 1421, 4 m, 9.2 x 12.4 mm. **G-I.** Touho, MONTROUZIER, stn 1270, 10-35 m, 7.2 x 8.6 mm. **J-L.** Western Australia, Broome, 6 m, 15.5 x 18.8 mm, coll. C.Vilvens.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♦ aperture flaring, with 8 elongated denticles on the outer lip and a basal tooth producing a notch with the abapical columellar tooth;
♦ two strong columellar teeth, the adapical one rounded, the abapical one squared; columella weakly excavated with a few different in size denticles; translucent callus shield covering the umbilical area and partially the parietal area, with weak superficial ridging on the parietal zone
♦ base with 4 granular spiral cords; distance between cords similar to the size of cords;
♦ no umbilicus;
♦ brown or cream with brown flames.

This species was originally described as belonging to the genus *Perrinia*. But it is clear that some features of this species, especially the two strong columellar teeth and the inductural callus shield, are discordant with the *Perrinia* characterization (see below) and match on the contrary the main *Clypeostoma* features.

Clypeostoma adelon n. sp.
Figs 17D–L, Tables 12,13

Type material. Holotype (5.2 x 3.7 mm) MNHN (IM-2000-32796). Paratypes: 4 MNHN (IM-2000-32797), 1 paratype CV.

Type locality. New Caledonia, Koumac, MONTROUZIER, stn 1323, 20°41'S, 164°15'E, 82-120 m.

Material examined. New Caledonia. BATHUS 2: stn DW739, 22°35'S, 166°27'E, 465-525 m, 1 dd. – Stn DW717, 22°44'S, 167°17'E, 350-393 m, 1 dd. – MONTROUZIER: stn 1331, 20°40'S, 164°11'E, 55-57 m, 2 dd juv. – Stn 1315, 20°41'S, 164°15.E, 66-87 m, 1 dd. – Stn 1323, 20°41'S, 164°15'E, 82-120 m, 14 lv (with holotype and paratypes). – Stn 1321, 20°45'S, 164°15'E, 90-115 m, 1 dd, 1 dd juv.
Loyalty Islands. LIFOU 2000: stn 1461, 20°54'S, 167°02'E, 100-120 m, 3 dd sub. – Stn 1462, 20°47'S, 167°03'E, 70-120 m, 1 dd.
Fiji. SUVA 2: stn BS18, 18°11'S, 178°28'E, 83 m, 1 dd. – BORDAU 1: stn DW1440, 17°11'S, 178°43'W, 190-308 m, 1 dd.
Vanuatu. MUSORSTOM 8: stn DW1070, 15°37'S, 167°16'E, 184-190 m, 2 dd. – BOA 0: stn CP2326, 15°41'S, 167°03'E, 260-313m, 1 dd. – SANTO 2006: stn EP28, 15°38'S, 167°05'E, 90-110 m, 1 dd. – Stn AT88, 15°32'S, 167°15'E, 87-115 m, 1 dd.
Solomon Islands. SALOMON 2: stn DW2169, 9°01'S, 159°06'E, 100-200 m, 2 dd. – Stn DW2234, 6°51'S, 156°24'E, 182-277 m, 3 dd, 8 dd sub. – SALOMONBOA 3: stn CP2840, 10°25'S, 161°22'E, 121-180 m, 1 dd sub.
Distribution. New Caledonia, 57-465 m, lv at 82-120 m; Loyalty Islands, 100-120 m (dd); Fiji, 83-190 m (dd); Vanuatu, 110-260 (dd); Solomon Islands, 180-182 m (dd).

Diagnosis. A rather small chilodontid species with an elevated, conical shape and an angular periphery, with an exsert dome-shaped protoconch, 5 granular cords on the penultimate whorl, a subrounded aperture with two teeth, a weakly convex base with 5 spiral cords and an inductural callus covering completely the umbilicus.

Description. *Shell* of small for the genus (height 5.2 mm, width 3.7 mm), higher than wide, rather thick, conical; spire elevated, height 1.4x to 1.6x width, 3.2x to 3.7 aperture height; anomphalous.
Protoconch about 200 µm, of 1 whorl, translucent, exsert dome-shaped, with a straight, thin terminal varix.
Teleoconch up to 5.9 almost flat whorls with 5 granular spiral cords on last whorls; distance between cords similar in size to cords; angular periphery. Suture canaliculated.
First whorl convex, sculptured by about 15 rather strong prosocline threads;
interspace between them 2x to 3x size of threads; P3 and P4 appearing near end of whorl, granular. On second whorl, axial threads of same size and same interspace, connecting beads of cords. On third whorl, P1 and P2 resolving, thin, granular; beads of all cords separated. On fourth whorl, P1, P2 and P3 similar in size, P4 stronger; beads of P1 slightly vertically elongated, beads of P4 stronger, horizontally elongated; axial threads stronger, becoming thick ribs;

Figure 15 (scale bar: 5 mm).

A-U. ***Clypeostoma nortoni*** (McLean, 1984). **A-I.** Philippines. **A-F.** Balicasag Is., PANGLAO 2004, stn P3, 100 m. **A-C.** 11.0 x 8.3 mm. **D-F.** Juvenil, 8.0 x 6.7 mm. **G-I.** Bohol Is., PANGLAO 2005, stn CP2340, 291-318 m, 12.5 x 10.1 mm (Marbol 35489). **J-L.** Taiwan, Bashi channel, TAIWAN 2000, stn DW36, 305 m, 9.8 x 6.7 mm. **M-O.** Indonesia, Kai Is., KARUBAR, stn CP16, 315-349 m, 9.5 x 7.6 mm. **P-U.** Solomon Is., SALOMON 2, stn DW2191, 300 m. **P-R.** 8.9 x 6.7 mm. **S-U.** 6.9 x 6.1 mm.
V-X. ***Clypeostoma chranos*** n. sp., southeastern coast of Taiwan, holotype MNHN (IM-2000-32795), TAIWAN 2002, stn DW149, 258 m, 8.0 x 5.9mm.

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S1 appearing near half whorl. On fifth whorl, all cords similar in size, except P4 stronger; distance between cords similar in size to cords. On last whorl, P4 the strongest, making keel, their strong pointed beads giving a stellate shape from a basal view.
Aperture subrounded; outer lip flaring beyond an internal thickening, with 9 horizontally elongated denticles corresponding to the external spiral cords of last whorl and thinner similar denticles between them; inner lip with 1 to 3 rounded denticles.
Columella straight, opisthocline, weakly excavated, without two teeth, the adapical one rounded obtuse and the abapical stronger and squared.
Base moderately convex flat, with 5 granular spiral cords, the most internal one partly covered by an expansion of the inner lip; distance between cords 1x to 2x size of cords; strong axial threads between cords. Umbilicus completely filled by columellar callus; umbilical area and internal parietal area covered by an inductural callus shield, parietal part translucent.
Colour of teleoconch yellowish white to light brown; protoconch off white.
Operculum corneous, multispiral with central nucleus, light brown, translucent.

	TW	H	W	HA	H/W	H/HA
holotype	5.9	5.2	3.7	1.5	1.41	3.47
paratype 1	5.6	4.9	3.3	1.5	1.48	3.27
paratype 2	5.8	4.8	3.4	1.3	1.41	3.69
paratype 3	5.2	4.5	3.2	1.4	1.41	3.21
paratype 4	5.3	4.6	2.9	1.4	1.59	3.29
paratype CV	5.1	4.6	3.2	1.4	1.44	3.29

Table 13. *Clypeostoma adelon* n. sp.: Shells measurements in mm for types.

Discussion. The new species is superficially close to *Clypeostoma cancellatum* (Schepman, 1908) from central Indo-Pacific (figs 16A-X), but this greater species has a smaller H/W ratio (about 1.2-1.3) and a sunken protoconch.
C. adelon n. sp. is also similar to *C. cecileae* (Poppe, Tagaro & Dekker, 2006) from the Philippines (figs 17A-C), but this slightly greater species lacks a S1 spiral cord, has spiral cords with less numerous beads and has only 4 spiral cords on the base.

Etymology. Invisible (Ancient Greek: αδηλος, ον) – with reference to the possible confusion of the new species with two others, making it difficult to detect.

Genus ***Pholidotrope*** Herbert, 2012
Type species: *Pholidotrope gloriosa* Herbert, 2012 (by original designation) – North-western Madagascar, west of Banc of Leven, 35–150 m.

Remarks. The main features for *Pholidotrope* (Herbert, 2012) are a conical shape, a very small size (H < 5 mm), a cancellate sculpture, a columella with a single basal tooth and a U-shaped notch under it, a parietal glossy inductural callus shield and especially a strong, subterminal labral varix behind the outer lip.

Pholidotrope asteroeides n. sp.
Figs 17M–S, Table 14

Type material. Holotype (3.8 x 2.7 mm) MNHN (IM-2000-32804). Paratype: 1 MNHN (IM-2000-32805).

Type locality. New Caledonia, Norfolk Ridge, NORFOLK 1, stn DW1675, 24°45'S, 168°09'E, 231-233 m.

Material examined. New Caledonia. SMIB 8: stn DW159, 24°46'S, 168°08' E, 241-245 m, 1 lv (paratype). – NORFOLK 1: stn DW1675, 24°45'S, 168°09' E, 231-233 m, 1 lv (holotype).

Distribution. Southern New Caledonia, alive in 233-241 m.

Diagnosis. A very small, much higher than wide, chilodontid species with a conical shape, an angulated periphery, 3 granular spiral cords, the abapical cord much stronger with strong pointed beads and making keel, an additional thinner cord on last whorl, a weak columellar tooth, an almost flat base with 3 spiral cords and no umbilicus.

Description. *Shell* of moderate size for the genus (height up to 3.9 mm, width up to 2.7 mm), higher than wide, rather thick, conical; height 1.4x to 1.5x width, height 2.8x to 2.9x aperture height; anomphalous.
Protoconch unknown (broken on the two available samples).
Teleoconch up to 5.7 weakly convex to nearly flat whorls, bearing 3 spiral cords on the penultimate whorl, the abapical cord much stronger than the other cords, making keel, stellate with thick pointed beads; strong axial prosocline ribs between cords; periphery angulated. Suture visible, not canaliculated.

First whorl convex, sculptured by prosocline, smooth, moderately thick threads, interspace from about 2x the width of threads; P2 and P3 appearing at end of whorl or at begin of next whorl, weakly granular. On second whorl, P2 and P3 quickly stronger, with rounded beads made by intersection of cords and threads. On third whorl, P1 appearing, thinner than the other cords; beads of P2 and P3 stronger, those of P3 a little pointed; distance between cords similar to width of cords. On fourth whorl, P3 much stronger than the other cords, with sharply pointed beads and making keel; P1 and P2 similar in size; axial threads thickening, making ribs; distance between ribs about 2x width of ribs. On last whorl, P4 visible, much thinner than the other cords; beads of P3 very thick and strongly pointed; periphery carinate, stellate in shape because the peaks of P3.

Columella almost straight, more or less vertical, with a small, weakly prominent basal tooth.

Aperture subelliptical, without angle; interior nacreous, exterior with a thickened, rather low varix; outer lip slightly thickened inside, with 10 to 12 ridge-like denticles, that nearest columella making a U-shaped notch between it and columella tooth; inner lip somewhat flaring in its lower part.

Base almost flat, with 3 rather strong granular spiral cords, more or less similar in size to P4; distance between cords 1x to 1.5x width of cords; rather strong axial ribs between cords, distance between them similar to width of ribs; upper parietal part covered by a thin inductural callus.

No umbilicus.

Colour of teleoconch brown with some beads (especially those of P3) white; protoconch white.

	TW	H	W	HA	H/W	H/HA
holotype	5.7	3.8	2.7	1.3	1.41	2.92
paratype	5.0	3.9	2.6	1.4	1.50	2.79

Table 14. *Pholidotrope asteroeides* n. sp.: Shells measurements in mm for types.

Discussion. *Pholidotrope asteroeides* n. sp. is rather close to *P. gloriosa* Herbert, 2012 from Glorieuses Islands (Madagascar area), but this similar in size species has a smaller H/W ratio (1.18 - compare with 1.4 to 1.5 for the new species), three spiral cords of the whorls more or less similar in strength with a distance between cords greater (not similar) than the cords, a much wider inductural callus and a slightly stronger, more pointed columellar tooth.

The new species reminds a little *Perrinia morrisoni* (Ladd, 1966) from Bikini Atoll, but this similar in size species is much more depressed, has 4 spiral cords on the penultimate whorls and lacks the external apertural varix.

The new species weakly resembles *Perrinia stellata* (A.Adams, 1864) from western Indian Ocean and Red Sea (figs 20V-X), but this much greater species (height up to 15 mm) has 4 spiral cords on the penultimate whorls with a stronger P1 with thicker beads and a peripheral P4 with much blunter beads, and stronger spiral cords on the base; it also lacks the external varix on the border of the aperture.

Etymology. Star shaped (Ancient Greek: αστεροειδης, ες adjective) – with reference to the stellate shape of the periphery of the shell.

Pholidotrope choiseulensis n. sp.
Figs 17T–W

Type material. Holotype (2.7x1.8 mm) MNHN (IM-2000-32806).

Type locality. Solomon Islands SALOMON 2, stn DW2234, 6°51'S, 156°24'E, 192-277 m, 1 dd.

Material examined. Solomon Islands. SALOMON 2: stn DW2234, 6°51'S, 156°24'E, 192-277 m, 1 dd (holotype).

Diagnosis. A very small, much higher than wide, chilodontid species with a conical shape, a more or less rounded periphery, 3 granular spiral cords with rather thick bead on the penultimate whorl, the abapical cord slightly stronger with weakly pointed beads, a weak columellar tooth, an almost flat base with 3 spiral cords and no umbilicus.

Description. *Shell* of rather small size for the genus (height 2.7 mm, width 1.8 mm), higher than wide, rather thick, conical; height 1.5x width, height 3.4x aperture height; anomphalous.

Protoconch bulbous, prominent, about 1.25 whorl, with a thin, weakly convex terminal varix.

Teleoconch of 5 weakly convex to almost flat whorls, with 3 more or less similar in size spiral cords on the penultimate whorl, the abapical cord a little stronger on last whorl; rounded periphery. Suture visible, not canaliculated.

First whorl convex, sculptured by rather indistinct smooth prosocline threads; interspace similar in size to width of threads. On second whorl, threads thickening and more marked; P2 and P3 appearing at mid whorl. On third whorl, P1 appearing, thinner than the other cords; all cords with rounded beads made by intersection of cords and threads; P3 slightly stronger than the other cords. On fourth whorl, all cords more or less similar in size; interspace between cords smaller than cords; beads of cords rather strong, isolated from each other. On last whorl, P3 slightly stronger than the other cords, with slightly pointed

beads; P4 visible, thinner than the other cords; wide axial ribs still present, connecting beads of the cords.
Columella almost straight, slightly opisthocline, with a small, weakly prominent basal tooth.
Aperture subelliptical, without angle; interior nacreous, exterior with a moderately thickened varix rather far from the aperture rim; outer lip slightly thickened inside, with 10 ridge-like denticles.
Base almost flat, with 3 rather strong granular spiral cords, slightly thinner than P4; distance between cords similar in size to width of cords; rather strong axial ribs between cords, distance between them similar to width of ribs; upper parietal part covered by a thin, poorly visible inductural callus.
No umbilicus.
Colour of teleoconch cream with brownish flames on the whorls; protoconch white.
Operculum corneous, multispiral with central nucleus and short growing edge, light brown, somewhat translucent.

Discussion. *Pholidotrope choiseulensis* n. sp. is rather close to *P. gloriosa* Herbert, 2012 from Glorieuses Islands (Madagascar area), but this similar in size species has a smaller H/W ratio (1.18 against 1.5 for the new species), much thinner spiral cords on the whorls with a much greater distance between them and much smaller beads, a much wider inductural callus and a stronger, more prominent columellar tooth.
The new species reminds only weakly *P. asteroeides* n. sp. from New Caledonia (figs 17M-S), this slightly greater species having a very different shape with much more pointed beads on P3 and an angulated periphery.

Etymology. Named after Choiseul Island (Solomon Islands - native name Lauru), the type locality area.

Genus ***Danilia*** Brusina, 1865
Type species: *Monodonta limbata* Philippi, 1844 (by monotypy) [= *Monodonta tinei* Calcara, 1839] (by monotypy) – Recent, Mediterranean Sea.

Remarks. The main features for *Danilia* are a turbinate shall with a cyrtoconoidal to almost conical elevated spire, more or less convex whorls, a flat to even sunken protoconch, a reticulated sculpture, a half-moon shaped aperture, two columellar teeth with the abapical one usually stronger and an exterior subterminal varix along the outer lip of the aperture.

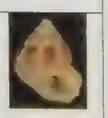
Danilia	shell shape	size	number of cords on penul-timate whorl	which Si/Ti present ?	spiral lirae in aperture ?	number of cords on base	columella - columellar teeth	colour	frontal view
angulosa	sl. Cyrtoco-noidal	8x7.5	9	S1, S2 + S3 + S4; T1, T2	Y	7-8	deeply excavated - ab. strong squared, ad. weak	yellowish or ochre beige	
discordata	conical	12.8 x9.5	8	S1, S2 + S4; T1, T2	Y	6-8	deeply excavated - ab. strong squared, ad. very weak	brown + possibly brown maculations	
eucheliformis	cyrtoco-noidal	9.6x7.6	6	S1, S2 + S4	Y	5-6	deeply excavated - ab. strong rounded, ad. weak	off white + greyish and brownish marks	
stroggylon n. sp.	sl. Cyrtoco-noidal	7.7x5.5	6	S1, S2 + S4	Y (strong)	5-6	weakly excavated - ab. strong, ad. weak	light-brown + axial reddish brown flames	

Table 15. Comparison of conchological features of small central Indo-Pacific *Danilia* species (sl. = slightly, ab. = abapically, ad. = adapically).

Danilia angulosa Vilvens & Héros, 2005
Figs 18A–H, Table 15

Danilia angulosa Vilvens & Héros, 2005: 54-55, figs. 1-7. Type locality: New Caledonia, 220 m.
Danilia angulosa – Poppe, Tagaro & Dekker, 2006: 32.
Danilia angulosa – Herbert, 2012: 414-415.

Material examined. New Caledonia. EBISCO: stn DW2547, 21°06'S, 158°36'E, 356-438 m, 1 dd.
Vanuatu. SANTO 2006: stn DS99, 15°33'S, 167°17'E, 100-105 m, 1 dd, 1 dd sub.
Solomon Islands. SALOMON 2: stn DW2173, 9°06'S, 159°02'E, 201-231 m, 1 dd. – SALOMONBOA 3: stn DW2790, 08°19'S, 160°37'E, 314-586 m, 1 dd juv. – Stn CP2804, 09°15'S, 161°21'E, 150-175 m, 1 dd.
French Polynesia, Australes Archipelago. BENTHAUS: stn DW1957, 23°19'S, 149°29'W, 558-1000 m, 1 dd. – Stn DW1894, 27°40'S, 144°22'W, 100 m, 1 dd.

Distribution. New Caledonia, 150-356 m, lv at (dd - using data from the original description); Loyalty Islands, 120-150 m, lv at 70-120 m; Vanuatu, 469-472 m (dd); Fiji, 105-469 m (dd); Solomon Islands, 175-314 m (dd); French Polynesia, Australes Archipelago, 100-558 m (dd); Tonga, 555-581 m (dd).

Remarks. The main characteristics of this species are:
- height up to about 8.0 mm, width up to about 7.5 mm; about 5 whorls;
- protoconch sunken;
- on first whorl, prosocline threads; P1 and P3 almost immediately, P3 stronger, P2 a bit later; on second or third whorl, P3 producing a shoulder; subsutural ramp oblique and slightly convex; S1, S2 and S3 appearing later; on fourth whorl, additional tertiary cords T2 and T3 appearing respectively between P2 and S2, and between S2 and P3; P4 becoming visible on fifth whorl;
- on last whorl, P3 peripheral, making keel; S4 visible; possibly a tertiary cord between S3 and P4 or between P4 and S4; beads of P3 especially pointed;
- aperture subcircular, outer lip with 20 to 25 plications with an exterior subterminal varix along it;
- columella straight, opisthocline, deeply excavated, with two teeth, the adapical one much weaker, rounded (possibly reduced to a swelling), the abapical one squared;
- base moderatly convex with 7 to 8 granular spiral cords;
- anomphalous; whitish, translucent callus shield covering the umbilical area and partially the parietal area;
- yellowish or ochre beige, with brown dots on some spiral cords or brown flammules on whole whorls.

The additional samples from Solomon Islands and Australes Archipelago extend the distribution area to a larger area of the the Central Pacific. But this species seems rather rare and found only at rather great depths.

Danilia discordata Vilvens & Héros, 2005
Figs 18I–T, Table 15

Danilia discordata Vilvens & Héros, 2005: 60, figs. 25-27. Type locality: Vanuatu, 375-397 m.
Danilia discordata – Poppe, Tagaro & Dekker, 2006: 32.
Danilia discordata – Herbert, 2012: 419.

Material examined. Vanuatu. BOA 1, stn DW2459, 16°11'S, 167°20'E, 336-353 m, 1 dd. – Stn CP2465, 16°43'S, 1 dd.167°59'E, 770-799 m.
Solomon Islands. SALOMON 1: stn CP1831, 10°12'S, 161°19'E, 135-325 m, 1 dd. – Stn DW1856, 9°46'S, 160°52'E, 254-281 m, 1 dd. – SALOMON 2: stn DW2183, 8°17'S, 160°00'E, 489-491 m, 2 dd juv. – Stn CP2200, 7°44'S, 158°30'E, 325-331 m, 1 dd. – Stn DW2204, 7°14'S, 158°29'E, 286-423 m, 3 dd. – Stn DW2229, 6°36'S, 156°20'E, 315-418 m, 1 dd. – Stn CP2248, 7°42'S, 156°25'E, 650-673 m, 1 dd. – SALOMONBOA 3: stn DW2811, 09°42'S, 161°30'E, 228-238 m, 2 dd. – Stn CP2853, 09°47'S, 160°54'E, 264-285 m, 1 dd. – Stn DW2859, 09°19'S, 160°19'E, 320-330 m, 1 dd.
Philippines. MUSORTOM 3: stn CP105, 13°52'N, 120°30'E, 398-417 m, 1 dd. – PANGLAO 2005: stn DW2362, 08°57'N, 123°33'E, 679-740 m, 1 dd. – Stn DW2364, 09°01'N, 123°26'E, 427 m, 1 dd.
New Caledonia. LAGON: stn DW475, 18°36'S, 163°11'E, 415-460 m, 1 dd.
Loyalty Islands. MUSORSTOM 6: stn DW398, 20°47'S, 167°06'E, 320-370 m, 1 dd.

Distribution. Vanuatu, 353-770 m (dd - using data from the original description); Solomon Islands, 238-650 m (dd); Philippines, 417-679 m (dd); New Caledonia, 415-460 m (dd); Loyalty Islands, 320-370 m (dd).

Remarks. The main characteristics of this species are:
- height up to 12.8 mm, width up to 9.5 mm;
- about 5 to 5.5 convex whorls;
- protoconch sunken into first teleoconch whorl;
- conical in shape;
- on first whorl, prosocline threads; interspace between ribs 2 times larger than width of ribs; on second whorl, P2, P3 and P4 almost simultaneously, similar in size; P1 a bit later, weaker; S1 and S2 from end of second whorl to end of third whorl, S3 absent; all cords granular with small beads, except P4 with scaly, sharp pointed beads; on third whorl, beads of P3 and P4 sharp; on fourth whorl, Ti appearing, usually T1 appearing between P1 and S1 and T2 between S1 and P2; P3 and P4 the strongest; beads of P3 and P4

very sharp, horizontally oriented; beads of P1 pointed, adapically oriented; beads of other cords rounded, reduced, sometimes even flattened; axial threads still present, visible but rather thin; S4 emerging from suture; on last whorl, P3 and P4 peripheral, making weak keels; possibly additional tertiary cords;

♦ aperture rounded to elliptical, flaring; outer lip with rather strong varix; inside flaring, lirate within with about 20 rather weak plications, the 3 ridges near inner lip stronger;

♦ columella straight, weakly opisthocline, deeply excavated, with two teeth, the adapical one much weaker and rounded, the abapical one stronger and squared;

♦ base moderately convex, sculptured with 6 to 8 granular spiral cords, similar in size; interspace between cords less than or equal to cords, filled with broad axial threads.

♦ anomphalous; whitish, translucent callus shield covering the umbilical area and partially the parietal area;

♦ brown, sometimes with large brown strip-like maculations.

At the time of the original description, this species was only known by the holotype (with protoconch missing). The additional samples from Solomon Islands, a neighbouring area of the original description zone (Vanuatu), are useful to confirm or clarify the features of this species (including the protoconch), and also to highlight an intraspecific variability of the shell. These new records extend the distribution area to a larger area of the Central Pacific, from Philippines to New Caledonia. But this species seems rather rare and only found at great depths.

Danilia eucheliformis (Nomura & Hatai, 1940)
Figs 19A–D, Table 15

Monodonta eucheliformis Nomura & Hatai, 1940: 61, pl III, figs 1a-b. Type locality: Japan (north-eastern Honshu).
Danilia eucheliformis – Vilvens & Héros, 2005: 56, figs. 15-18.

Material examined. Taiwan. TAIWAN 2001: stn CP74, 24°51'S 121°59'E, 220 m, 1 dd. –TAIWAN 2002: stn DW149, 22°19'N, 121°29'E, 258 m, 3 dd.

Indonesia, Kai Islands. KARUBAR: stn DW18, 05°18'S, 133°01'E, 205-212 m, 1 dd.

Distribution. Japan, 50-200 m (*fide* Habe, 1961; Kuroda, Habe & Oyama, 1971); Taiwan, 220-420 m (dd); Indonesia, Kai Islands, 205 212 m (dd).

Remarks. The main characteristics of this species are:

♦ height up to 9.6 mm, width up to 7.6 mm; up 5.5 whorls;

♦ protoconch sunken into first teleoconch whorl;

♦ cyrtoconoidal in shape, with convex whorls; rounded periphery;

♦ on first whorl, prosocline threads, distance between at least 2x wider than threads; on second whorl, P4, P3, P2 and P1 successively; S1 and S2 at third whorl, quickly similar in size to Pi; S3 absent; S4 visible on last whorl; all cords granular with small, largely separated, pointed beads; distance between cords about 1.5x size of cords; axial threads still visible, connecting beads of cords, producing a reticulate pattern;

♦ aperture rounded to ovate; outer lip with an external rather strong external varix and about 20-25 rather weak plications inside;

♦ columella straight, vertical, deeply excavated, with two teeth, an abapical rounded, stronger one and an adapical weaker one;

♦ base moderately convex, sculptured with 5-6 granular spiral cords, similar in size; interspace between cords similar in size to cords, with thin axial threads;

♦ anomphalous; whitish, translucent callus shield covering the umbilical area and partially the parietal area;

♦ off white with greyish and brownish marks.

Danilia stroggylon n. sp.
Figs 19E–L, Tables 15,16

Type material. Holotype (8.0 x 5.9mm) MNHN (IM-2000-32798). Paratypes: 2 MNHN (IM-2000-32799).

Type locality. Southeastern coast of Taiwan, TAIWAN 2002, stn DW149, 22°19'N, 121°29'E, 258 m.

Figure 16 (scale bar: 5 mm).

A-X. ***Clypeostoma cancellatum*** (Schepman, 1908). **A-I.** Samples with S1 spiral cord. **A-F.** Philippines. **A-C.** Pamilacan Is., PANGLAO 2004, stn T36, 95-128 m, 7.4 x 6.2 mm. **D-F.** Aliguay Is., 100-150 m, 9.6 x 6.9, coll. C.Vilvens. **G-I.** Eastern New Caledonia, BATHUS 1, stn CP688, 270-282 m, 6.6 x 5.2 mm. **J-X.** Samples without S1 spiral cord. **J-O.**Solomon Islands. **J-L.**SALOMON 1, stn CP1758, 180-187 m, 8.4 x 6.7 mm. **M-O.** SALOMON 2, stn DW2254, 150 m, 9.4 x 7.6 mm. **P-R.** New Caledonia, BATHUS 2, stn DW732, 236-264 m, 7.6 x 5.5 mm. **S-U.** Taiwan, TAIWAN 2002, stn DW117, 126-153 m, 6.9 x 5.6 mm. **V-X.** Tonga Islands, BORDAU 2, stn DW1601, 200-487 m, 4.3 x 3.1 mm.

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Material examined. Taiwan. TAIWAN 2002: stn DW149, 22°19'N, 121°29'E, 258 m, 1 dd (holotype and paratypes).
Indonesia, Kai Isl. KARUBAR, stn DW18, 05°18SN, 133°01'E, 205-212 m, 1 lv.

Distribution. Taiwan, 28 m (dead); Indonesia, Kai Is., 205-212 m (living).

Diagnosis. A small size chilodontid *Danilia* species with a rather elevated, weakly cyrtoconoidal shape, almost flat whorls and a rounded periphery, 6 granular, similar in size cords on the penultimate whorl, a subrounded aperture with a strong external varix on the border, a convex base with 5 spiral cords and a granular inductural callus shield covering completely the umbilicus.

Description. *Shell* of small size for the genus (height up to 7.7 mm, width 5.5 mm), higher than wide, rather thick, weakly cyrtoconoidal to almost conical; spire elevated, height 1.3x to 1.4x width, 3.0x to 3.2x aperture height; anomphalous.
Protoconch of about 1 whorl, diameter about 200 µm, rather flattened, sunken into the first teleoconch whorl, without terminal varix.
Teleoconch to 5.2 weakly convex to almost flat whorls, with 6 rather strong spiral granular cords on penultimate whorl; distance between cords similar in size to cords; rounded periphery. Suture visible, canaliculated.
First whorl convex, sculptured by about 20 rather strong, slightly prosocline threads;
interspace between them 2x size of threads; P4 resolving before end of whorl, P3 and P2 a bit later, all granular. On second whorl, P1 appearing near suture; P4 the strongest, P1 the weakest; beads of all cords produced by intersection between cords and threads, separated; beads of cords quickly pointed after mid of whorl, except those of P1. On third whorl, all cords much stronger, P4 the strongest with very pointed beads; axial threads becoming strong ribs; distance between cords about 1.5x size of cords; S1 and S2 appearing near end of whorl; S3 absent. On fourth whorl, pointed beads of cords becoming blunt, beads of P1 slightly vertically elongated; axial ribs still present and strong, making with cords a reticulate pattern. On last whorl, all the 6 cords similar in size, distance between them similar to the size of cords; S4 fully visible, emerging from suture, weaker than the other cords.
Aperture subrounded, flaring from internal thickening; strong external varix making the border of the outer lip (paratypes) or separated from this border by a thickening made by accumulation of growth lines; outer lip with 10 rather strong plications on the border; inner lip with a stronger basal denticle, producing a notch with the columella.
Columella straight, slightly opisthocline, weakly excavated, with two teeth, the abapical one stronger, pointed and possibly squared, the adapical one much weaker, rounded, possibly only inflated.
Base moderately convex, with 5-6 thick granular spiral cords, weaker than the cords of the last whorl, distance between cords 1x to 1.5x size of the cords; axial threads between cords.
Umbilicus completely filled by columellar callus; umbilical and parietal areas covered by an inductural callus shield (only visible on holotype).
Colour of teleoconch light-brown, with rather wide axial reddish brown flames; protoconch and base whitish.

	TW	H	W	HA	H/W	H/HA
holotype	5	7,1	5,4	2,4	1,31	2,96
paratype 1	5,2	7,7	5,5	2,4	1,40	3,21
paratype 2	5,1	7,1	5,2	2,4	1,37	2,96

Table 16. *Danilia stroggylon* n. sp.: Shells measurements in mm for types.

Figure 17 (scale bars: 1 mm)

A-C. ***Clypeostoma cecileae*** (Poppe, Tagaro & Dekker, 2006), Philippines, Mactan Is., paratype MNHN (Moll 5299), 50-100 m, 6.4 x 4.2 mm.
D-L. ***Clypeostoma adelon*** n. sp. **D-F.** Holotype MNHN (IM-2000-32796), New Caledonia, Koumac, MONTROUZIER, stn 1323, 82-120 m, 5.6 x 3.8 mm. **G-I.** Loyalty Islands, Lifou, LIFOU 2000, stn 1462, 70-120 m, 5.3 x 3.1 mm. **J-L.** Fiji, Viti Levu, SUVA 2, stn BS18, 83 m, 4.7 x 2.9 mm.
M-S. ***Pholidotrope asteroeides*** n. sp., New Caledonia. **M-P.** Holotype MNHN (IM-2000-32804), Norfolk Ridge, NORFOLK 1, stn DW1675, 231-233 m, 3.8 x 2.7 mm. **Q-S.** Paratype MNHN (IM-2000-32805), SMIB 8, stn DW159, 241-245 m, 3.9 x 2.6 mm.
T-W. ***Pholidotrope choiseulensis*** n. sp., holotype MNHN (IM-2000-32806), Solomon Islands, SALOMON 2, stn DW2234, 192-277 m, 2.7 x 1.8 mm.

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Discussion. Although the ontogeny of the spiral cords of the new species sounds very similar to the one of *D. eucheliformis* (Nomura & Hatai, 1940) from Western Pacific (figs 19A-D), the new species is different by its size (smaller for a similar number of whorls), the global shape of the shell (much more conical), the shape of the whorls (much less convex) and the shape of the spiral cords (similar in size with interspace similar in size to cords).
D. stroggylon n. sp. may also be compared to *D. galeata* Vilvens & Héros, 2005 from Indonesia, but this proportionally greater size species has a more elevated spire, more numerous spiral cords on the last whorls, a spiral cord P4 making keel giving to the shell a subangular periphery and a more reduced, obtuse abapical columellar tooth.
One can wonder about the huge gap between the two distribution areas (Taiwan and Indonesia), but it's a fact that the Indonesian sample match perfectly the description of the Taiwanese new species.

Etymology. Stocky (Ancient Greek: στρογγυλος, η, ον) – with reference to the stocky shape of the shell, producing a feeling of solidity.

Genus ***Chilodonta*** Etallon, 1859
Type species: *Chilodonta clathrata* Etallon, 1862 (by subsequent designation Bayan, 1874, Bulletin de la Société Géologique de France, ser. 3, 2: 335) – Jurassic (Oxfordian), France.

Remarks. The main features for *Chilodonta* are (Cossmann, 1918) a solid shell with a rather elevated spire, a reticulated sculpture all over the whorls and especially a complex apertural teeth system: one strong, prominent columellar tooth, a parietal tooth, an strong upper palatal tooth opposite to the columellar tooth and one or two weaker basal palatal teeth.

Chilodonta suduirauti Poppe, Tagaro & Dekker, 2006
Figs 19M–X

Chilodonta suduirauti Poppe, Tagaro & Dekker, 2006: 30-31, pl.7, figs.1-2.

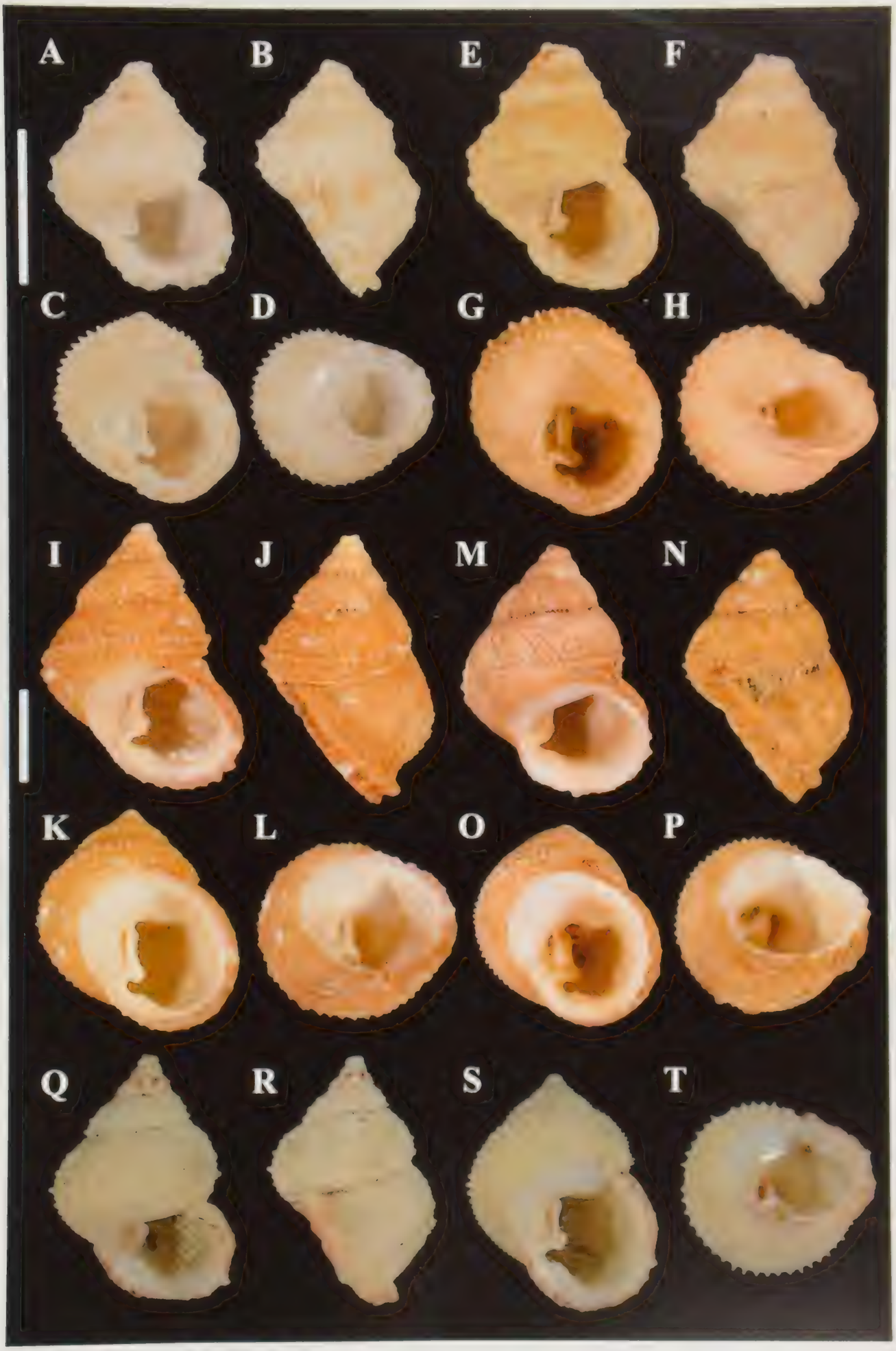
Material examined. Philippines. PANGLAO 2005: stn DW2364, 09°01'N, 123°26'E, 427 m, 3 dd, 4 dd sub, 2 dd juv. – Stn CP2384, 08°46'N, 123°16'E, 624-647 m, 1 dd. – Stn DW2401, 09°31'N, 123°40'E, 397-410 m, 1 dd.
Solomon Islands. SALOMON 1: stn DW1825, 9°50'S, 160°58'E, 340-391 m, 1 dd. – SALOMON 2: stn DW2183, 8°17'S, 160°00'E, 489-491 m, 1 dd. – Stn CP2199, 7°43'S, 158°30'E, 296-304 m, 1 dd. – SALOMONBOA 3: stn CP2786, 08°31'S, 160°41'E, 320-520 m, 1 dd.
New Caledonia. EBISCO: stn DW2555, 21°04'S, 158°35'E, 500-614 m, 1 dd.
Indonesia, Kai Islands. KARUBAR: stn DW13, 05°26'S, 132°38'E, 417-425 m, 1 dd, 1 dd sub. – Stn DW28, 05°31'S, 132°54'E, 448-467 m, 1 dd 1 dd sub.

Distribution. Philippines, 410-624 m (dd - including data from Poppe et al., 2006); Solomon Islands, 304-489 m (dd); New Caledonia, 500-614 m (dd); Indonesia, Kai Islands, 425-448 m (dd).

Remarks. The main features of this species are:
- height up to 8.4 mm, width up to 7.0 mm;
- spire rather elevated, weakly cyrtoconoidal;
- teleoconch of up to 6 weakly convex whorls;
- first whorl with thin prosocline threads; second whorl with Pi (i=1→4), P4 sunken under the suture; S1 and S2 appearing quickly, similar in size to Pi, all granular with pointed, separated beads, connected by axial threads, giving a reticulated pattern; P4 emerging from suture on fourth whorl; possibly Ti between Pi and Si near end of last whorl;
- one very strong columellar tooth projecting out of columella border;
- aperture elliptical, with a translucent inductural callus shield on the parietal wall; outer lip with a strong palatal tooth and 4-5 denticles; basal lip with a strong tooth with an U-shaped notch between it and the columellar tooth;
- base almost flat, with 5 to 7 granular spiral cords; distance between cords similar to size of cords; axial thin threads between cords;
- no umbilicus;
- white to light brownish white.

Figure 18 (scale bars: 5 mm).

A-H. ***Danilia angulosa*** Vilvens & Héros, 2005. **A-D.** New Caledonia, Bellona, EBISCO, stn DW2547, 21°06'S, 7.1 x 6.1 mm. **E-H.** Solomon Islands, SALOMON 2, stn DW2173, 201-231 m, 8.0 x 3.1 mm.
I-T. ***Danilia discordata*** Vilvens & Héros, 2005. **I-L.** Solomon Islands, SALOMON 2, stn DW2229, 315-418 m, 12.8 x 9.6 mm. **M-P.** SALOMONBOA 3, stn DW2811, 228-238 m, 12.1 x 9.2 mm. **Q-T.** Vanuatu, BOA 1, stn DW2459, 336-353 m, 11.4 x 8.4 mm.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The records here reported extend substantially the distribution of this species, especially considering the single record in north-western New Caledonia (Bellona Reef). It can be now considered that *Chilodonta suduirauti* is a western Indo-Pacific widespread species. No variability per area is observed: it can only be noticed that some Solomon samples are slightly less elevated and light brownish white instead of white coloured, while the Indonesian samples have slightly more convex whorls and are brownish coloured.

Genus ***Perrinia*** H. & A.Adams, 1854
Types species: *Monodonta angulifera* A.Adams, 1854 in 1853 (by subsequent designation Pilsbry, 1889) – Recent, Philippines.

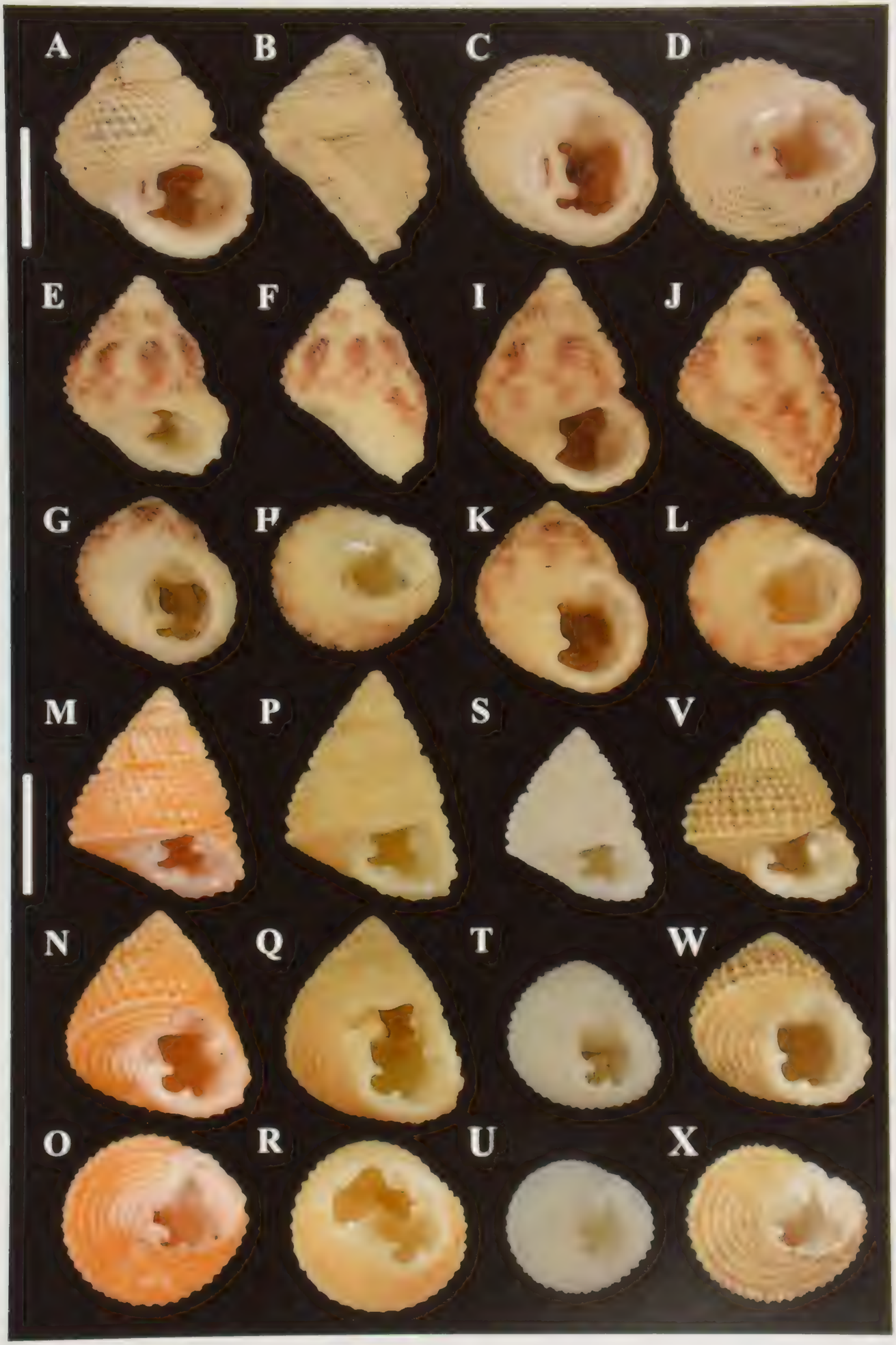
Remarks. The main features for *Perrinia* are a rather small to medium size (H < 20 mm), an elevated spire with slightly convex to almost flat whorls, an axial sculpture on the first whorls with addition of axial cords on the next whorls producing a cancellate to almost foveolate pattern, a single basal columellar tooth without U-shaped notch under it and the absence of any inductural callus shield (Herbert, 2012).

Perrinia	shell shape	size (mm)	number of spiral cords on penultimate whorl	axial threads	which Si/Ti present ?	number of cords on base	open umbilicus ?	colour	frontal view
angulifera	conical, spire elevated	16 x11.5	5	Y	S1; T1	5-6	N	greyish white to pale buff	
elisa	conical, spire elevated	20 x14.5	3	Y	-	5-6	N	off white to pale beige	
cantharidoides n. sp.	conical, spire very elevated	8.7 x5.6	5	Y	S1 + S4	4	N	with with possible bownish flames	
guadalcanalensis n. sp.	coeloconoidal on adapical part and conical on abapical part	7x5.2	5	Y	S1 + S4	6-7	N	off white with possible bownish flames	
squamocarinata	conical, spire mod. elevated	9.2 x6.5	3 (4)	Y	-	5(4)	minute	nacreous white with pinkish flames	

Table 17. Comparison of conchological features of some central Indo-Pacific *Perrinia* species (mod. = moderately).

Figure 19 (scale bars: 5 mm).

A-D. ***Danilia eucheliformis*** (Nomura & Hatai, 1940), Taiwan, off Tashi, TAIWAN 2001, stn CP74, 24°51'S 121°59'E, 220 m, 7.6 x 7.6 mm.
E-L. ***Danilia stroggylon*** n. sp., Taiwan, TAIWAN 2002, stn DW149, 258 m. **E-H.** Holotype MNHN (IM-2000-32798), 7.1 x 5.4 mm. **I-L.** Paratype MNHN (IM-2000-32799), 7.7 x 5.5 mm.
M-X. ***Chilodonta suduirauti*** Poppe, Tagaro & Dekker, 2006. **M-R.** Solomon Islands. **M-O.** SALOMONBOA 3, stn CP2786, 320 520 m, 8.6 x 7.0 mm. **P-R.** SALOMON 1, stn DW1825, 9°50'S, 160°58'E, 340-391 m, 9.2 x 6.6 mm. **S-U.** New Caledonia, Western Bellona, EBISCO, stn DW2555, 500-614 m, 6.1 x 5.3 mm. **V-X.** Indonesia, Kai Islands, KARUBAR, stn DW28, 448-467 m, 7.3 x 6.4 mm.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Perrinia angulifera (A.Adams, 1853)
Figs 20A–I, Table 17

Monodonta angulifera A.Adams, 1853: 176. Type locality: Puerto Galero, Mindoro Is., Philippines, 11 m.
Tectaria montrouzieri P.Fischer, 1878: 212–213. Syn.
Cantharidus pliciferus Schepman 1908: 43, pl. 3, fig. 3. Syn.
Perrinia plicifera – Poppe, Tagaro & Dekker, 2006: 45, pl. 15, fig. 7. Syn.
Perrinia angulifera – Herbert, 2012: 465-470, figs 52-53.

Material examined. New Caledonia. LAGON: stn DW2, 22°19'S, 166°24'E, 14 m, 1 dd. – Stn DW3, 22°21'S, 166°22'E, 15 m, 1 dd. – Stn DW25, 22°21'S, 166°27'E, 28 m, 1 dd. – Stn DW52, 22°14'S, 166°14'E, 13 m, 1 dd sub. – Stn DW56, 22°10'S, 166°15'E, 11 m, 1 dd. – Stn DW71, 22°20'S, 166°34'E, 22 m, 2 dd. – Stn DW80, 22°31'S, 166°28'E, 33 m, 1 dd. – Stn DW83, 22°32'S, 166°30'E, 22 m, 1 dd. – Stn DW92, 22°27'S, 166°37'E, 24 m, 1 dd. – Stn DW94, 22°30'S, 166°34'E, 17 m, 1 dd. – Stn DW104, 22°26'S, 166°40'E, 24 m, 1 dd. – Stn DW116, 22°25'S, 166°44'E, 43 m, 1 dd. – Stn DW123, 22°30'S, 166°40'E, 21 m, 3 dd. – Stn DW151, 22°32'S, 166°48'E, 31-33 m, 2 dd. – Stn DW154, 22°33'S, 166°40'E, 29 m, 1 dd. – Stn DW201, 22°00'S, 165°59'E, 17 m, 1 dd. – Stn DW233, 22°35'S, 166°46'E, 30 m, 1 dd. – Stn DW264, 22°19'S, 166°20'E, 19 m, 4 dd. – Stn DW266, 22°22'S, 166°17'E, 19 m, 1 dd. – Stn DW269, 22°18'S, 166°18'E, 20 m, 1 dd. – Stn DW271, 22°15'S, 166°21'E, 22 m, 1 dd. – Stn DW275, 22°14'S, 166°18'E, 19 m, 1 dd. – Stn DW285, 22°24'S, 166°26'E, 19 m, 1 dd. – Stn DW313, 22°40'S, 166°50'E, 30 m, 1 dd. – Stn DW348, 22°42'S, 166°55'E, 45 m, 1 dd. – Stn DW572, 22°52'S, 167°00'E, 65 m, 1 dd. – Stn DW765, 21°14'S, 165°42'E, 35 m, 1 dd. – Stn DW788, 21°02'S, 165°35'E, 33 m, 1 dd. – Stn DW789, 21°03'S, 165°34'E, 29 m, 1 dd. – Stn DW863, 20°39'S, 165°07'E, 28 m, 1 dd sub. – Stn DW942, 20°37'S, 164°13'E, 15 m, 1 dd. – Stn DW1010, 20°09'S, 163°57'E, 16 m, 1 dd. – Stn DW1017, 20°08'S, 163°51'E, 21 m, 1 dd. – Stn DW1027, 20°03'S, 163°51'E, 29 m, 1 dd. – Stn DW1034, 19°58'S, 163°58'E, 23 m, 1 dd. – Stn DW1037, 19°58'S, 164°00'E, 25 m, 1 dd. – Stn DW1094, 19°54'S, 163°41'E, 26 m, 1 dd. – Stn DW1174, 19°21'S, 163°14'E, 53 m, 1 dd. – CORAIL 2: stn DW21, 20°36'S, 161°02'E, 86 m, 1 dd. – Campagnes d'essais 1987: stn DE29, 22°35'S, 166°41'E, 29-33 m, 1 dd. – Stn DE58, 22°11'S, 166°11'E, 17-18 m, 2 dd. – Stn DE65, 22°21'S, 166°22'E, 18 m, 1 dd. – BATHUS 1: stn DW1233, 22°24'S, 166°48'E, 45-50 m, 40 lv. – MONTROUZIER: stn 1260, 20°44'S, 165°14'E, 49–59 m, 4 dd, 1 dd juv. – Stn 1261, 20°46-47'S, 165°15-16'E, 45-56 m, 6 lv, 1 dd juv. – Stn 1277, 20°34'S, 164°16'E, 0-2 m, 1 dd. – Stn 1299, 20°34'S, 164°13'E, 12-14 m, 1 dd juv. – Stn 1304, 20°39'S, 164°13'E,12-15 m, 1 dd. – Stn 1305, 20°36'S, 164°11'E, 12-15 m, 2 dd juv. – Stn 1307, 20°34'S, 164°10'E, 12 m, 6 dd juv. – Stn 1308, 24°40'S, 164°15'E, 15-20 m, 1 dd. – Stn 1309, 20°41'S, 164°13'E, 18 m, 1 dd juv. – Stn 1312, 20°40'S, 164°15'E, 26-40 m, 2 dd sub. – Stn 1314, 20°40'S, 164°15'E, 30-63 m, 2 dd, 2 dd sub, 1 dd juv. – Stn 1315, 20°41'S, 164°15'E, 66-87 m, 2 dd. – Stn 1321, 20°45'S, 164°15'E, 90-115 m, 1 dd juv. – Stn 1372, 22°20'S, 166°13'E, 50 m, 1 dd juv. – Stn 1492, 22°20'S, 166°26'E, 20 m, 1 dd. – NORFOLK 1: stn DW1673, 23°39'S, 168°00' E, 278 m, 1 dd. – EBISCO: stn DW2608, 19°33'S, 158°40'E, 393-396 m, 1 dd juv.
Loyalty Islands. LIFOU 2000: stn1648, 20°54'S 167°03'E, 150-200 m, 3 lv juv.
Fiji. SUVA 2: stn BS18, 18°11'S, 178°28'E, 83 m, 3 dd. – Stn CP65, 17°48'S, 177°13/04'E, 32 m, 3 dd. – SUVA 4: stn DW26, 18°24'S, 178°04'E, 42-43 m, 4 dd. – Stn DW44, 17°52'S, 177°13'E, 33 m, 4 dd, 2 dd sub. – Stn DW62, 17°48'S, 177°13/04'E, 32 m, 9 dd.
Wallis Island. MUSORSTOM 7: stn DW2, 13°22'S, 176°11'W, 52-55 m, 1 dd
Vanuatu. MUSORSTOM 8: stn CP1131-1132, 15°38'S, 167°03-04'E, 140-182 m, 1 dd. – Stn deep water "mixed", 1 dd.
Indonesia, Kai Islands. KARUBAR: syn DW01, 05°46'S, 132°10'E, 156-305 m, 1 dd sub. – Stn DW18, 05°18'S, 133°01'E, 205-212 m, 1 dd.
Philippines. PANGLAO 2004: stn L69-73, 09°31'N, 123°41'E, 90-98 m, 9 dd juv.

Distribution. New Caledonia, 2-393 m, lv at 45-50 m; Loyalty Islands, lv at 150-200 m; Fiji, 32-83 m (dd); Wallis Island, 52-55 m (dd); Vanuatu, 140 182 m (dd); Indonesia, 13-205 (dd - using also data of Schepman, 1908); Philippines, 90-98 m (dd - using also data of Poppe et al., 2006 *[P. plicifera]*).

Remarks. The main characteristics of this species are:
- height up to about 16.0 mm, width up to about 11.5 mm;
- protoconch nearly flat, at the same level as the first teleoconch whorl;
- teleoconch up to 7.5 almost straight whorls;
- first whorl with axial threads only; P1, P2, P3 appearing at end of whorl, granular; P4 covered by suture; S1 appearing about half a whorl later, quickly as strong as other cords; T1 at third whorl, between P1 and S1;
- penultimate whorl with 5 spiral cords with axial threads between them; P1 with sharp pointed, triangular, adapically oriented beads, possibly a bit scaly; P3 as strong as P1, with slightly axially elongated beads; occasionally, T2 may appear between P1 and T1;

♦ P4 peripheral on last whorl, thin, at the beginning of the base;
♦ angular periphery without keel;
♦ moderately convex base with 5-6 (sometimes up to 8) spiral cords, axial threads between them;
♦ one moderately prominent columellar tooth at second abapical third;
♦ outer lip thin, thicker internally, with up to 16 spiral lirae running inside, abapical ones possibly terminating near columella and producing small denticles below columella tooth;
♦ no umbilicus;
♦ greyish white to pale buff.

Perrinia elisa (Gould, 1849)
Figs 20J–L, Table 17

Trochus elisus Gould, 1849: 92. Type locality: Pickering, Singapore, dredged.
Calliostoma (Perrinia) Elisa [sic] – Schepman, 1908: 68.
Perrinia elisa – Poppe, Tagaro & Dekker, 2006: 43, pl.15, fig. 4,6.

Material examined. Philippines. MUSORSTOM 3: stn DR140, 11°43'N, 122°34'E, 93-99 m, 12 dd sub. – PANGLAO 2004: stn T26, 09°43'N, 123°49'E, 123-135 m, 1 dd. – AURORA 2007: stn DW2758, 15°55'N, 121°50'E, 151-173 m, 1 dd.

Distribution. Philippines, 50-200 m (using also data of Poppe et al., 2006); Indonesia, 32-90 m (using data of Schepman, 1908); Vietnam (*fide* Poppe et al., 2006).

Remarks. The main characteristics of this species are:
♦ height up to about 20.0 mm, width up to about 14.5 mm;
♦ protoconch nearly flat, at the same level as the first teleoconch whorl;
♦ teleoconch up to 7.5 almost straight whorls;
♦ first whorl with poorly distinct, low axial ribs, P1, P2, P3 appearing at end of whorl, granular; P4 covered by suture; on next whorls, P3 the strongest with horizontally elongated beads, P1 almost as string as P3 with axially elongated beads, P2 the weakest; axial ribs connecting beads of cords, more or less orthocline on first whorl, clearly prosocline on the last whorls; suture strongly channelled; P4 peripheral on last whorl, thin, at the beginning of the base; P3 making keel;
♦ angular periphery without keel;
♦ moderately convex base with 5-6 spiral cords, distance between smaller then cords; rather thick, close axial threads between them;
♦ one median, poorly prominent columellar tooth with a second abapical tooth below;
♦ outer lip thin, thicker internally, with up to 11 spiral lirae running inside, never reaching aperture rim;
♦ no umbilicus (covered by columellar callus);
♦ off white to pale beige.

Perrinia cantharidoides n. sp.
Figs 20M–U, Tables 17, 18

Type material. Holotype (8.4 x 5.4 mm) MNHN (IM-2000-32800). Paratypes: 3 MNHN (IM-2000-32801).

Type locality. New Caledonia, Chenal de Koumac, MONTROUZIER, stn 1315, 20°41'S, 164°15'E, 66-87 m.

Material examined. New Caledonia. VAUBAN 1978-1979: Sud NC, stn DW10, 22°17'S 167°05'E, 80 m, 1 dd. – MUSORSTOM 4: stn DW231, 22°34'S, 167°10'E, 75 m, 2 dd, 2 dd sub. – CORAIL 2: stn DW26, 20°22'S, 161°05'E, 62 m, 1 dd. – MONTROUZIER: stn 1315, 20°41'S, 164°15'E, 66-87 m, 7 dd (with holotype and paratypes).
Vanuatu. BOA 1: stn CP2476, 16°42'S, 167°53'E, 91-103 m, 3 dd. – SANTO 2006: stn AT74, 15°37'S, 167°10'E, 50-64 m, 2 dd.

Distribution. New Caledonia, 62-80 m (dd); Vanuatu, 64-91 m (dd).

Diagnosis. A medium size *Perrinia* species, much higher than wide, with a conical shape, an angulated periphery, 5 granular spiral cords on penultimate whorl and an additional thinner cord on last whorl, the abapical cord much stronger, making keel, two columellar teeth, the abapical one much stronger, an almost flat base with 4 rather thin spiral cords and no umbilicus.

Description. *Shell* of moderate size for the genus (height up to 8.7 mm, width up to 5.6 mm), much higher than wide, rather thick, conical; height 1.6x to 1.7x width, height 3.5x to 3.9x aperture height; anomphalous.
Protoconch about 150 µm, of 1.25 whorl, prominent above the first teleoconch whorl, without clearly defined terminal varix.
Teleoconch up to 7.9 convex whorls, bearing 5 spiral cords on the penultimate whorl, the abapical cord much stronger than the other cords, making keel, with thick pointed beads; strong axial prosocline ribs between cords; periphery angulated. Suture visible, not canaliculated.
First whorl convex, sculptured by about 20 weakly prosocline, smooth, thin threads, interspace from 1.5x to 2x the width of threads. On second whorl, P3 and P4 rather weak, with pointed beads formed at intersection of cords and threads. On third whorl, P1 and P2 very weak, P3 and P4 thickening quickly, similar in size, making two similar keels. On fourth whorl, P4 slightly stronger than P3, both much stronger than P1 and P2 and still making keel; S1 appearing between end of 3rd and middle of 4th whorl,

similar in size to P1 and P2; axial threads thickening, making ribs; distance between ribs at least 2x width of ribs. On fifth whorl, P1 thickening, stronger than S1 and P2; beads of P4 transforming into blunt prickles; interspace between P3, P4 and axial ribs excavated. On last whorls, beads of P1 axially pointed; on last whorl, S4 visible, weaker than all other cords; periphery carinate, stellate by the prickles of P4.
Columella straight, vertical, with a rather strong to very strong rounded basal tooth and an inner part axially excavated.
Aperture subcircular, without angle; outer lip slightly thickened inside, without denticles but with up to 8 inner folds corresponding to external spiral cords; possibly one denticle at the base of inner lip making a U-notch under the columellar tooth.
Base almost flat, with 4 rather thin, subgranular to granular spiral cords, similar in size to S4; distance between cords about 1.5x width of cords, distance between S4 and outermost cord about 3x width of cords; rather close, thin axial ribs between cords.
No umbilicus.
Colour of teleoconch off with possible brownish flames on the whorls; spiral cords of the base with regular brownish spots; protoconch white.

	TW	H	W	HA	H/W	H/HA
holotype	7.1	8.4	5.4	2.4	1.56	3.50
paratype 1	7.9	8.7	5.6	2.3	1.55	3.78
paratype 2	7.5	8.6	5.4	2.2	1.59	3.91
paratype 3	7	8	4.7	2.2	1.70	3.64

Table 18. *Perrinia cantharidoides* n. sp.: Shells measurements in mm for types.

Discussion. The especially high H/W ratio combined with the columellar teeth and spiral sculpture of the whorls make it difficult to confuse the new species with the other Indo-Pacific *Perrinia* species, except two species.
First, the new species is rather close to *Perrinia stellata* (A.Adams, 1864) from western Indian Ocean (figs 20V-X), but this slightly greater species (height up to 15 mm) has a lesser H/W ratio, a much stronger peripheral keel, lacks S1, has a much weaker columellar tooth and stronger spiral cords on the base.
Secondly, *P. cantharidoides* n. sp. resembles *Clypeostoma cancellatum* (Schepman, 1908) from the Philippines (figs 16A-X), but this slightly greater species has especially a much more depressed shape and 6 spiral cords on the base.

Etymology. Shaped (Ancient Greek: -ωδης suffix) – with reference to shape of the shell, that is rather similar to one of *Cantharidus* (Trochidae: Cantharidinae) species.

Perrinia guadalcanalensis n. sp.
Figs 21A–G, Tables 17, 19

Type material. Holotype (6.8 x 5.2 mm) MNHN (IM-2000-32802). Paratypes: 2 MNHN (IM-2000-32803).

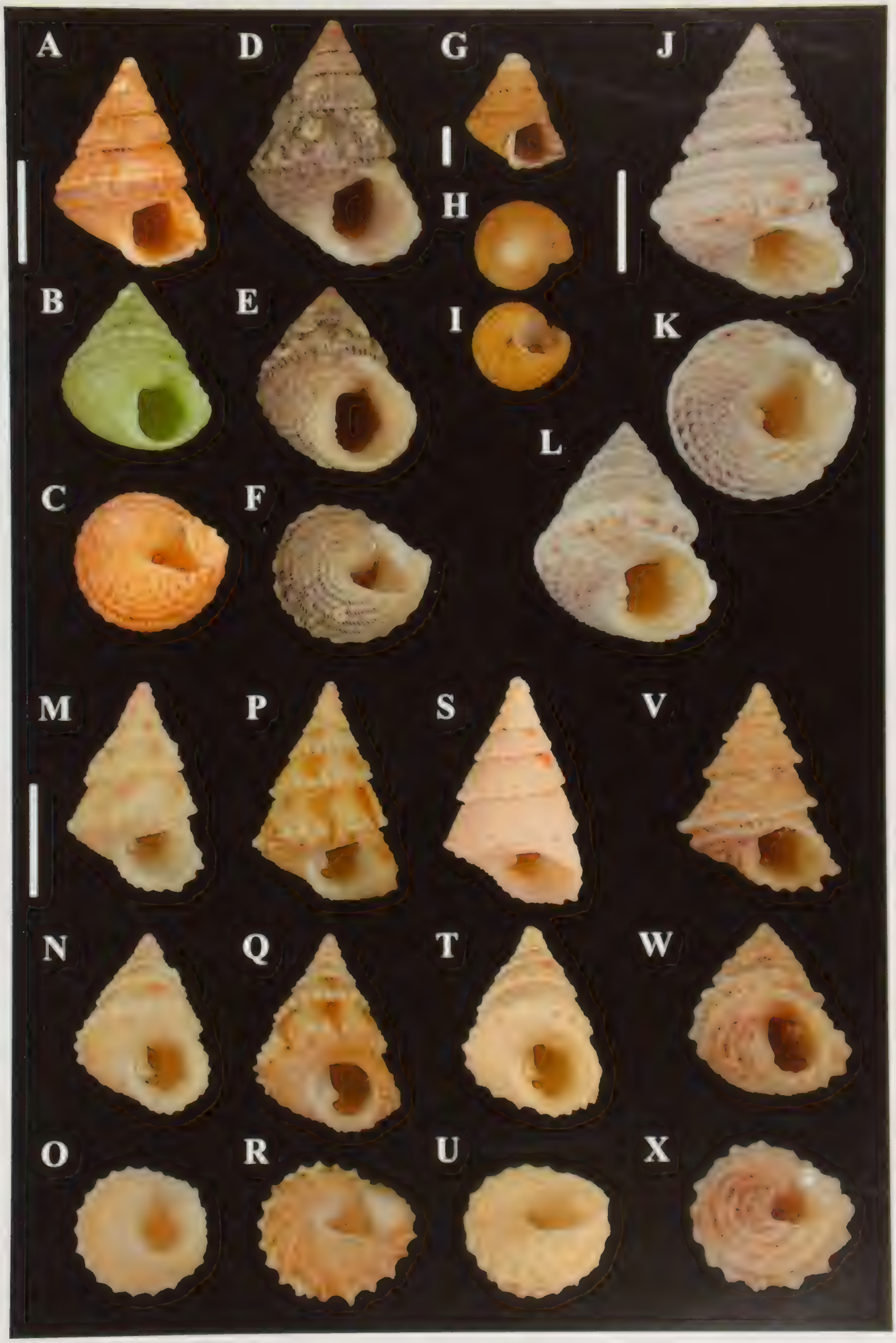
Type locality. Solomon Islands, off Guadalcanal Island SALOMON 1, stn DW1744, 10°32'S, 159°39'E, 49-55 m.

Material examined. Solomon Islands. SALOMON 1: stn DW1744, 10°32'S, 159°39'E, 49-55 m, 3 dd (holotype and 2 paratypes).

Distribution. Only known from the type locality.

Figure 20 (scale bars: 5 mm).

A-I. ***Perrinia angulifera*** (A.Adams, 1853), New Caledonia. **A-C.** BATHUS 1, stn DW1233, 45-50 m, 11.5 x 8.6 mm. **D-F.** LAGON, stn DW271, 22 m, 16.2 x 11.5 mm. **G-I.** Juvenile, Koumac, MONTROUZIER, stn 1309, 18 m, 3.2 x 2.4 mm.
J-L. ***Perrinia elisa*** (Gould, 1849), Vietnam, 40 m, 19.5 x 15.0 mm, coll. C.Vilvens.
M-U. ***Perrinia cantharidoides*** n. sp.. **M-R.** New Caledonia, Koumac, MONTROUZIER, stn 1315, 66-87 m. **M-O.** Holotype MNHN (IM-2000-32800), 8.4 x 5.4 mm. **P-R.** Paratype MNHN (IM-2000-32801), 8.7 x 5.6 mm.
S-U. Coral Sea, Lansdowne-Fairway Banks, CORAIL 2, stn DW26, 62 m, 9.7 x 5.7 m.
V-X. ***Perrinia stellata*** (A.Adams, 1864), Red Sea, Dahab, Sinai, 8.3 x 6.4 mm, coll. C.Vilvens.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Diagnosis. A rather small size, higher than wide, *Perrinia* species with a more or less conical shape, an angulated periphery, 5 granular spiral cords on penultimate whorl and an additional thinner cord on last whorl, the abapical cord much stronger and making keel, a strong basal columellar tooth, an almost flat base with 6-7 rather thin spiral cords and no umbilicus.

Description. *Shell* of moderate size for the genus (height up to 7 mm, width up to 5.2 mm), higher than wide, rather thick, coeloconoidal on the adapical part and more or less conical on the abapical part, height 1.3x to 1.4x width, height 3.8x to 3.9x aperture height; anomphalous.
Protoconch missing on all available samples.
Teleoconch up to 7 almost flat whorls, with 5 spiral cords on the penultimate whorl, the abapical cord much stronger than the other cords, making keel, with moderately thick pointed beads; strong slightly prosocline ribs between cords; periphery angulated. Suture visible, channelled, not canaliculated.
First whorl convex, with some weakly prosocline, smooth, low, wide threads. Second whorl less convex, with 4 Pi, with beads formed at intersection of cords and threads; P3 and P4 stronger. Third whorl almost flat, with S1 appearing; P3 and P4 thickening quickly; distance between cords similar to size of cords. On fourth whorl, P4 stronger than the other cords, making a weak keel. On fifth and sixth whorl, P1 thickening, stronger than S1, P2 and P3, weaker than P4; beads of P1 axially pointed, beads of P4 horizontally pointed; distance between P3 and P4 greater than cords, interspace between P3, P4 and axial ribs excavated. On last whorl, S4 visible, weaker than all other cords; periphery carinate, moderately stellate by the pointed beads of P4.
Columella straight, slightly prosocline, with a moderately strong rounded basal tooth.
Aperture subcircular, without angle; outer lip slightly thickened inside, with up to 9 inner folds (not clearly visible on holotype).
Base almost flat, with 6 to 7 thin, subgranular to nearly smooth spiral cords, much closer in the inner part; distance between cords from 1.5x to 2x width of cords; close, thin axial ribs between cords.
No umbilicus.
Colour of teleoconch off white with possible brownish flames on the whorls; spiral cords of the base with regular brownish spots.

	TW	H	W	HA	H/W	H/HA
holotype	7	6.8	5.2	1.8	1.31	3.78
paratype 1	5.7 (est)	6.6	5.2	1.7	1.27	3.88
paratype 2	6.8	7	5	1.8	1.40	3.89

Table 19. *Perrinia guadalcanalensis* n. sp.: Shells measurements in mm for types.

Discussion. The new species is only close to *P. cantharidoides* n. sp. from New Caledonia (figs 20M-U), but this slightly greater species has a much higher H/W ratio, P3 making two keels with P4 from the third to the fifth whorl, two columellar teeth and only 4 wider and subgranular (not almost smooth) spiral cords on the base.

Etymology. From Guadalcanal Island (Solomon Islands), off which the samples were collected.

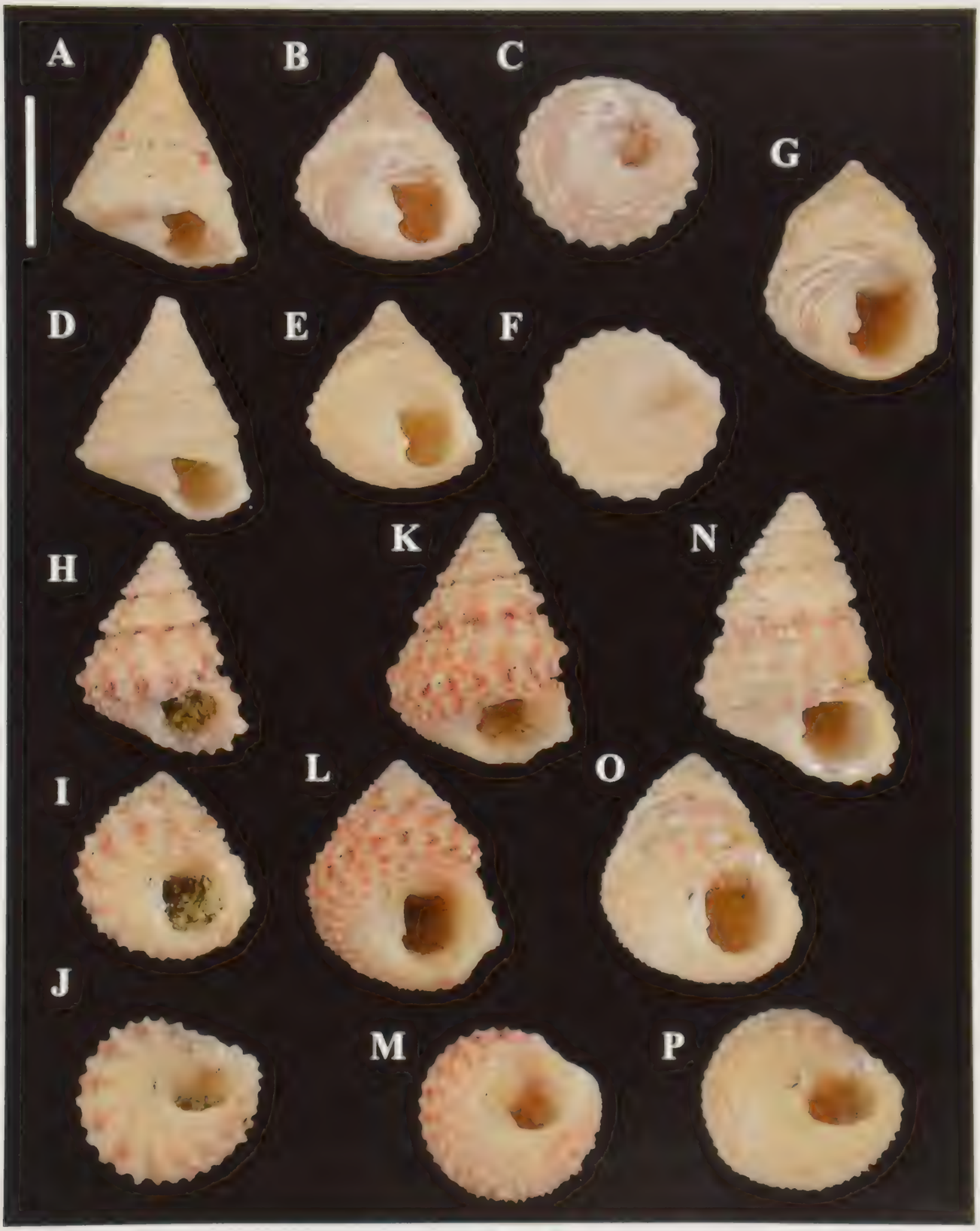
Perrinia squamocarinata (Schepman, 1908)
Figs 21H–P, Table 17

Calliostoma (Perrinia) squamocarinatum Schepman, 1908: 68-69, pl. VI, fig. 3 [*squamicarinatum*]. Type locality: Madura Bay, East Java, Indonesia, 69-91 m.
Perrinia squamicarinata [sic] – Poppe, Tagaro & Dekker, 2006: 45-46, , figs 38-39, pl.15, fig.5.
Perrinia squamocarinata – Herbert, 2012: 474, figs. 71E-F.

Philippines. AURORA 2007: stn CP2653, 16°06'N, 121°59'E, 83 m, 1 dd. – Stn CP2654, 16°04'N, 121°57'E, 98-107 m, 2 dd. – Stn CP2666, 15°58'N, 121°45'E, 199-307 m, 3 dd, 1 dd sub. – Stn DW2670, 14°52'N, 121°49'E, 180-187 m, 1 dd. – Stn CP2738, 16°04'N, 121°56'E, 111-113 m, 9 dd. – Stn CP2739, 16°05'N, 121°58'E, 96 m, 21 dd, 5 dd sub, 4 dd juv. –

Figure 21 (scale bar: 5 mm).

A-G. ***Perrinia guadalcanalensis*** n. sp., Solomon Islands, off Guadalcanal Island SALOMON 1, stn DW1744, 49-55 m. **A-C.** Holotype (IM-2000-32802), 6.8 x 5.2 mm. **D-F.** Paratype 1 (IM-2000-32803), 6.6 x 5.2 mm. **G.** Paratype 2 (IM-2000-32803), 7.0 x 5.0 mm, view of the apertural inner folds.
H-P. ***Perrinia squamocarinata*** (Schepman, 1908), Philippines. **H-M.** AURORA 2007, stn CP2654, 16°04'N, 121°57'E, 98-107 m. **H-J.** 5.5 x4.4 mm. **K-M.** 7.4 x 5.5 mm. **N-P.** AURORA 2007, stn DW2670, 14°52'N, 121°49'E, 180-187 m, 9.2 x 5.9 mm.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Stn CP2747, 15°56'N, 121°42'E, 120-124 m, 5 dd. – Stn CP2758, 15°55'N, 121°50'E, 151-173 m, 2 dd. – PANGLAO 2004: stn T4, 09°33'N, 123°49'E, 82 m, 3 dd, 2dd juv. – Stn T6, 09°35'N, 123°51'E, 34-82 m, 4 dd, 3 dd sub. – Stn T9, 09°34'N, 123°50'E, 97-120 m, 15 dd, 15 dd juv. – Stn T14, 9°42'N, 123°49'E, 101-110 m, 4 dd, 2 dd juv. – Stn T18, 09°42'N, 123°50'E, 80-100 m, 1 lv. – Stn T27, 09°33'N, 123°51'E, 106-137 m, 1 dd, 1 dd sub, 2 dd juv. – Stn T44, 09°34'N, 123°49'E, 83-86 m, 3 dd. – PANGLAO 2005: stn DW2370, 08°34'N, 123°09'E, 92-96 m, 1 dd.
Solomon Islands. SALOMON 2: stn DW2294, 8°47'S, 157°30'E, 105-128 m, 1 dd.

Distribution. Philippines, 50-199 m, lv at 80-100 m; Indonesia, East Java, 90 m (using data of Schepman, 1908); Solomon Islands, 105-128 m (dd).

Remarks. The main features of this species are:
♦ height usually about 9.2 mm, up to 6.5 mm, width usually about 4.2 mm, up to 5.2 mm;
♦ spire elevated, conical;
♦ protoconch glossy, very weakly convex (almost flat);
♦ teleoconch of up to 6.5 almost flat to weakly convex whorls; 3 granular spiral cords fully visible and a fourth usually partially covered by suture on the penultimate whorl; 4 cords on the last whorl;
♦ first whorl with prosocline threads, distance between threads about 2x width of threads; P2 and P3 at end of whorl, very thin; P1 at second whorl; on third whorl, threads thickening into ribs; spiral cords stronger, similar in size, beads at intersection of cords and ribs; on next whorls, P3 the strongest with pointed beads, P2 the weakest; P4 partially emerging from suture, visible on last whorl, peripheral, weaker than P2; on last whorl, pointed beads of P3 sharp and scaly;
♦ columella with a small basal tooth;
♦ aperture subelliptical; outer lip thickened inside, with about 8 inner folds;
♦ base moderately convex, with 5 granular spiral cords; distance between cords greater than size of cords; axial thin threads between cords;
♦ narrow umbilicus restricted to a slit or even closed by columellar callus;
♦ nacreous white with pinkish flames on the whorls and brownish spots on the cords.

The single record here reported from Solomon Islands, with a single dead adult sample, extends the distribution of this species to the Solomon Islands. Regarding the Philippine samples, the only different feature is the number of spiral cords on the base (4 instead of 5).

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